

INTRODUCTION

How to Use This Manual

The 92 CIVIC Shop Manual (Maintenance, Repair and Construction) is divided into two volumes (volume 1 and volume 2).

Make sure to refer both volumes when carrying out repair or maintenance of 92 CIVIC or when you want to know its construction.

This manual (volume 2) is divided into 7 sections. The first page of each section is marked with a black tab that lines up with its corresponding thumb index tab on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each section includes:

1. A table of contents, or an exploded view index showing:
 - Parts disassembly sequence.
 - Bolt torques and thread sizes.
 - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

⚠ WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard workshop* procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause **PERSONAL INJURY**, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

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Service Publication Office

■ Sections below are in VOLUME 1.
As sections with * include SRS components,
special precautions are required when servicing.

* General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and Emissions



Transaxle



* Steering



Suspension



Brakes
(Including ABS)



* Body



* Heater and
Air Conditioner



* Electrical
(Including SRS)



Driveshafts

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Special Tools

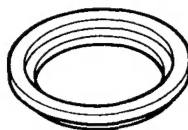
Ref. No.	Tool Number	Descruotion	Q'ty	Page Reference
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⑪	✓07926—SD90000	Companion Flange Holder	1	16-34, 37
⑫	✓07965—SD90100	Support Base	1	16-15



①



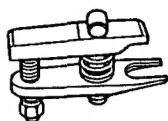
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③



④



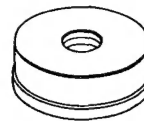
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⑥



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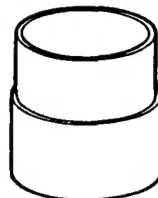
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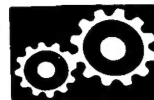


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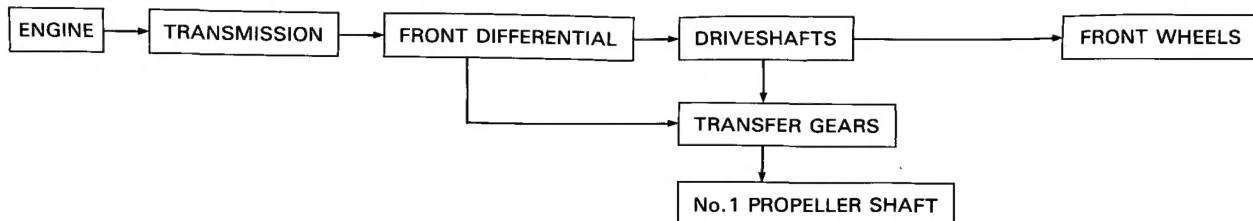
4WD Power Train



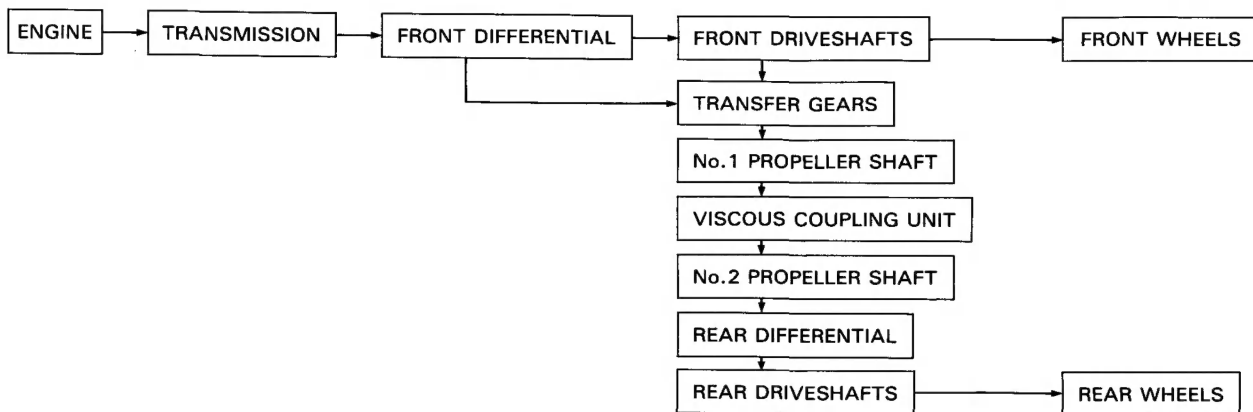
Construction

Power Flow:

2WD



4WD



General

When there is no difference in speed between the No.1 and viscous coupling unit (No.2 propeller shaft), power is transmitted to the front wheels through the front differential and the front driveshafts. The left driveshaft is connected to the differential by an intermediate shaft. The power is also turned 90 degrees by the transfer gears and transmitted to the No.1 propeller shaft. Whenever there is any speed difference between the No.1 propeller shaft and viscous coupling unit (No.2 propeller shaft), power is transmitted to the rear wheels via the viscous coupling unit, the No.2 and No.3 propeller shafts, the rear differential and the rear driveshafts.

Front Driveshaft

An intermediate shaft equalizes the length and angle of both driveshafts for easier steering on bumpy roads. The driveshaft end of this shaft runs on a bearing which is held by a holder on the engine case. A constant velocity universal joint at each end of the driveshafts ensures quieter operation and longer life. The front wheels run on an angular bearing for reduced friction.

Propeller Shaft

The propeller shaft carries power from the transfer to the rear differential. It is of a 2-piece construction and is supported by two rubber mounted bearings. The shaft has four universal joints: one tripod type and three yoke-and-spider type. These joints permit the shaft to lengthen and shorten, as the rear suspension moves.

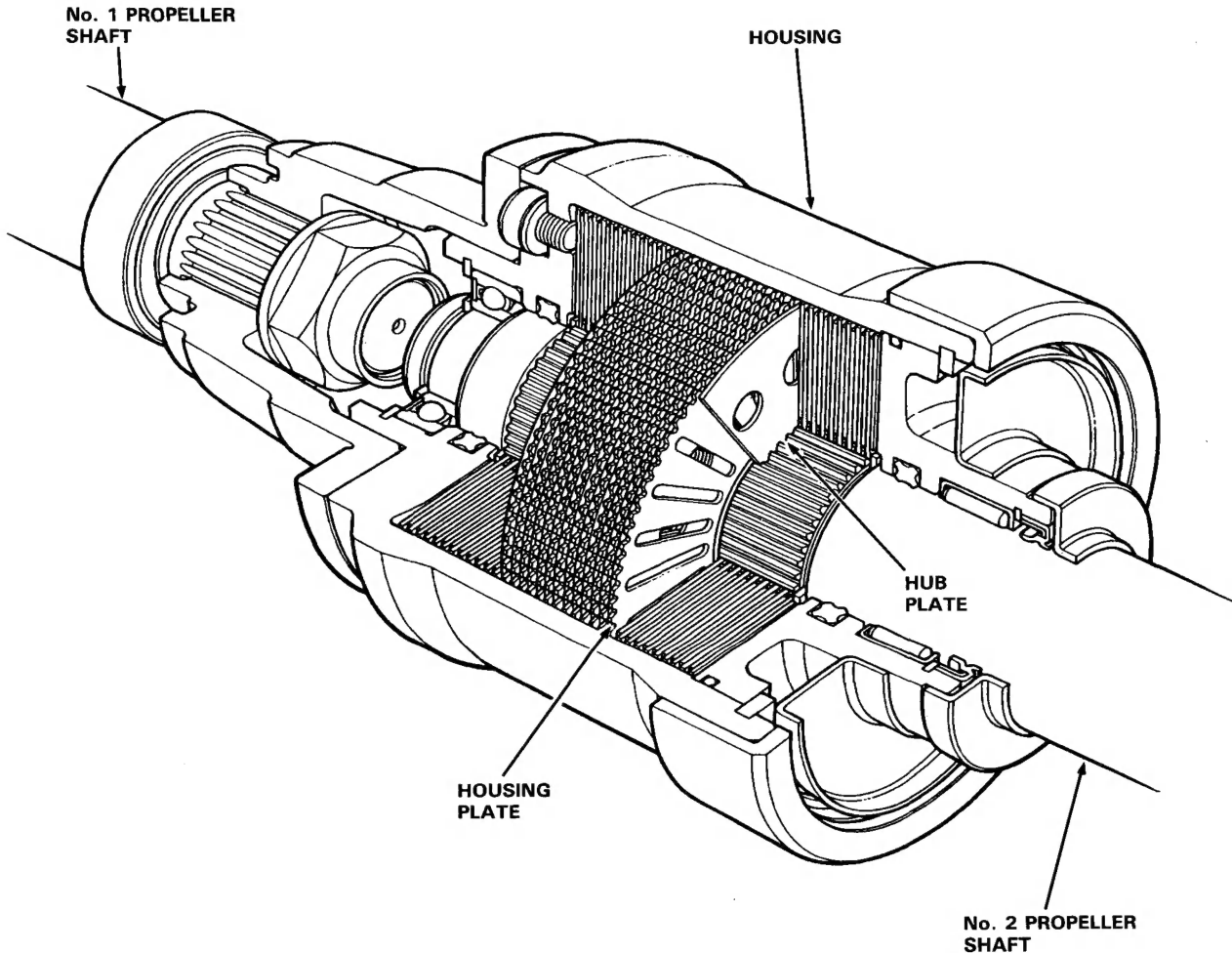
Rear Driveshafts

Refer to page 16-6.

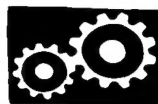
4WD Power Train

Viscous Coupling Unit

The viscous coupling unit is located on the front end of the No. 2 propeller shaft. It consists of a housing that is connected to the No. 1 propeller shaft by a tripod joint. Inside of the housing are 79 plates, which have 0.2 mm (0.008 in) of clearance between one another, surrounded by silicone oil. The 40 housing plates are engaged with the splines in the housing and the 39 hub plates are splined to the shaft. The plates have holes in them to aid in heat dissipation. The viscous coupling unit also contains approximately 10% air to allow for the thermal expansion of the silicone oil.

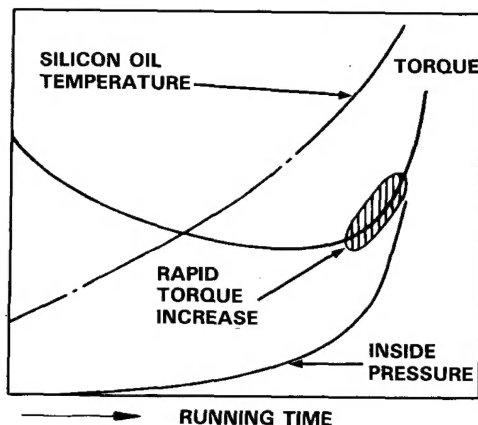


Whenever there is any difference in the speed of rotation between the No. 1 and No. 2 propeller shafts, such as when the front wheels lose traction, there is friction between the housing plates (drive side) and the hub plates (driven side). This friction is caused by the resistance of the plates sliding against the silicone oil. This resistance between the plates and the silicone oil is what begins to transmit torque from the housing plates to the hub plates and eventually to the rear wheels. This transmission of torque is proportionate to the difference in the speed of rotation of the wheels.



As the difference in propeller shaft speed continues, the temperature of the silicone oil keeps rising. Due to thermal expansion, the pressure inside the viscous coupling unit is also increasing as the temperature rises.

When the pressure becomes high enough, the housing plates begin to contact the hub plates and the engine torque to the rear wheels increases rapidly, as noted in the diagram at the right. To reduce plate wear, there are spacer rings to limit plate to plate contact.



As engine torque is delivered to the rear wheels, front and rear wheel traction stabilizes and the wheels begin to turn at the same speed. At this happens, the temperature of the silicone oil and the pressure in the viscous coupling unit decreases and power to the rear wheels decreases proportionately.

Front Driveshafts

Removal

INSPECTION

Driveshaft Boot

Check the boots on the driveshaft for cracks, damage, leaking grease or loose boot bands.

If any damage is found, replace the boot.

Spline Looseness

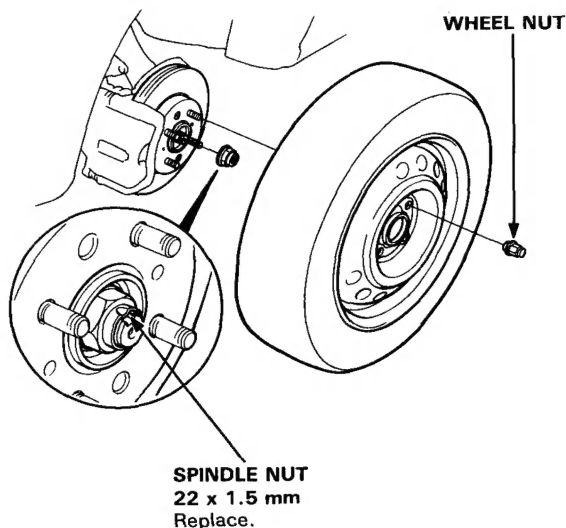
Turn the driveshaft by hand and make sure the spline and joint are not excessively loose.

If damage is found, replace the inboard joint.

Twisted or Cracked

Make sure the driveshaft is not twisted or cracked. Replace if necessary.

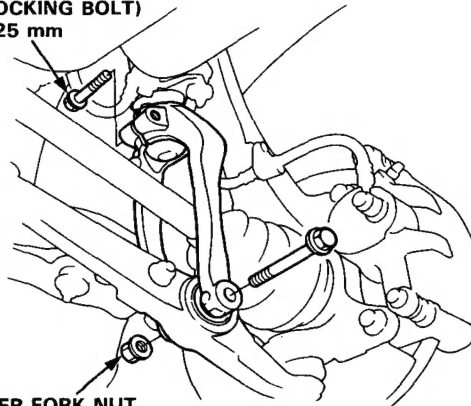
1. Raise the car and place safety stands in the proper locations (see Section 1).
2. Remove the front wheels.
3. Drain the transmission oil (see Section 15).
4. Raise the locking tab on the spindle nut and remove it.



5. Remove the damper fork nut and damper pinch bolt.

6. Remove the damper fork.

**DAMPER PINCH BOLT
(SELF-LOCKING BOLT)
10 x 1.25 mm**

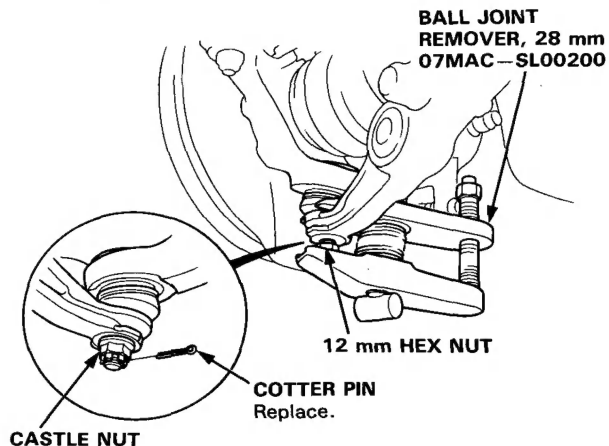


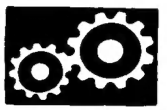
7. Remove the cotter pin from the lower arm ball joint castle nut and remove the nut.
8. Install the 12 mm hex nut on the ball joint. Be sure that the 12 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Use the Ball Joint Remover, 28 mm, as shown on page 18-11, to separate the ball joint and lower arm.

9. Position the special tool between the knuckle and lower arm as shown, then separate the lower arm.

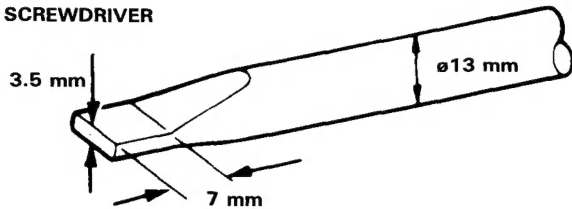
CAUTION: Be careful not to damage the ball joint boot.



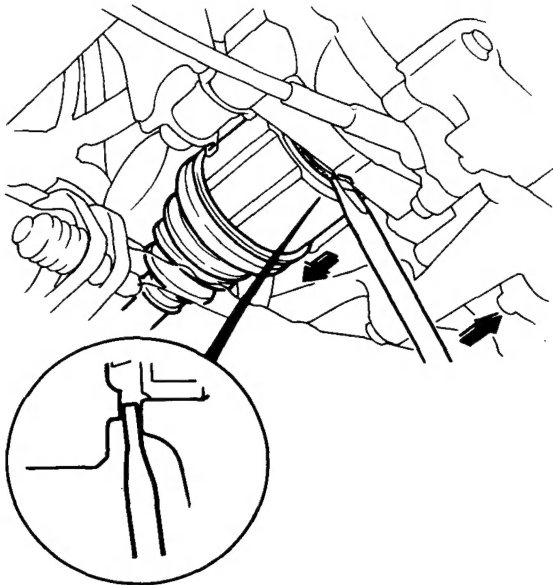


10. Pry the driveshaft assembly with a screwdriver as shown to force the set ring at the driveshaft end past the groove.

SCREWDRIVER



11. Pull the inboard joint and remove the driveshaft and CV joint from the differential case as an assembly.

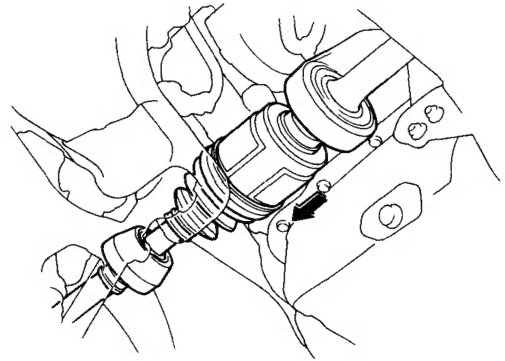


— With Intermediate Shaft:

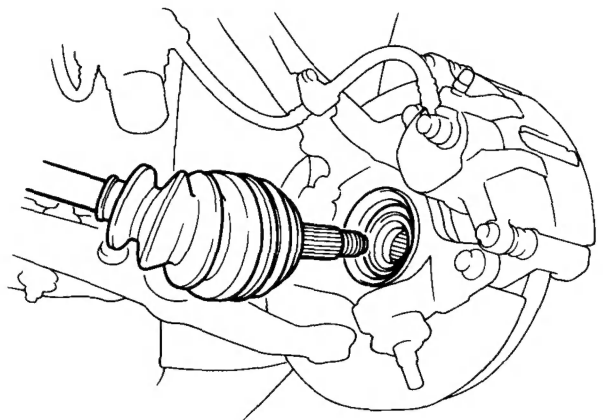
Remove the right driveshaft from the bearing support by tapping the inboard joint of the driveshaft with a plastic hammer.

CAUTION:

- Do not pull on the driveshaft, as the CV joint may come apart.
- Use care when prying out the assembly and pull it straight to avoid damaging the differential oil seal.



12. Pull the knuckle outward and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



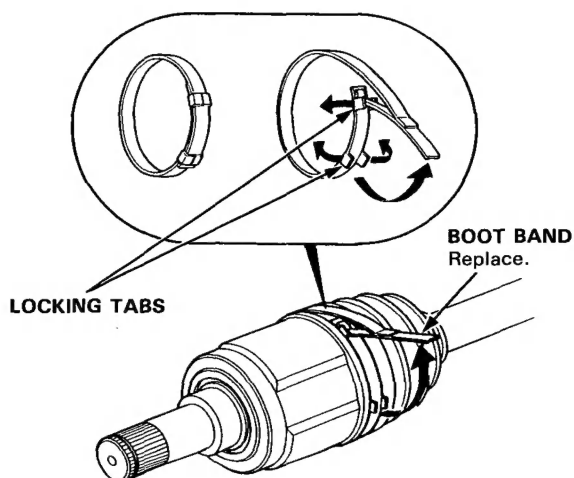
Front Driveshafts

Disassembly

1. To remove the boot band, pry up the locking tabs with a screwdriver and raise the end of the band.

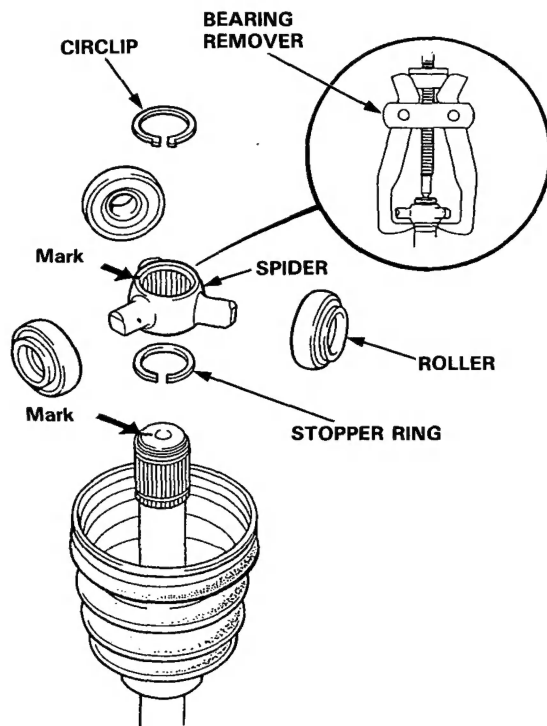
NOTE: Carefully clamp the driveshaft in a vise with soft jaws.

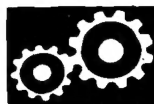
CAUTION: Take care not to damage the boots.



2. Remove the inboard joint and rollers.
3. Remove the circlip, then remove the spider using a commercially available bearing remover.

NOTE: Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.





Disassembly/Inspection

NOTE:

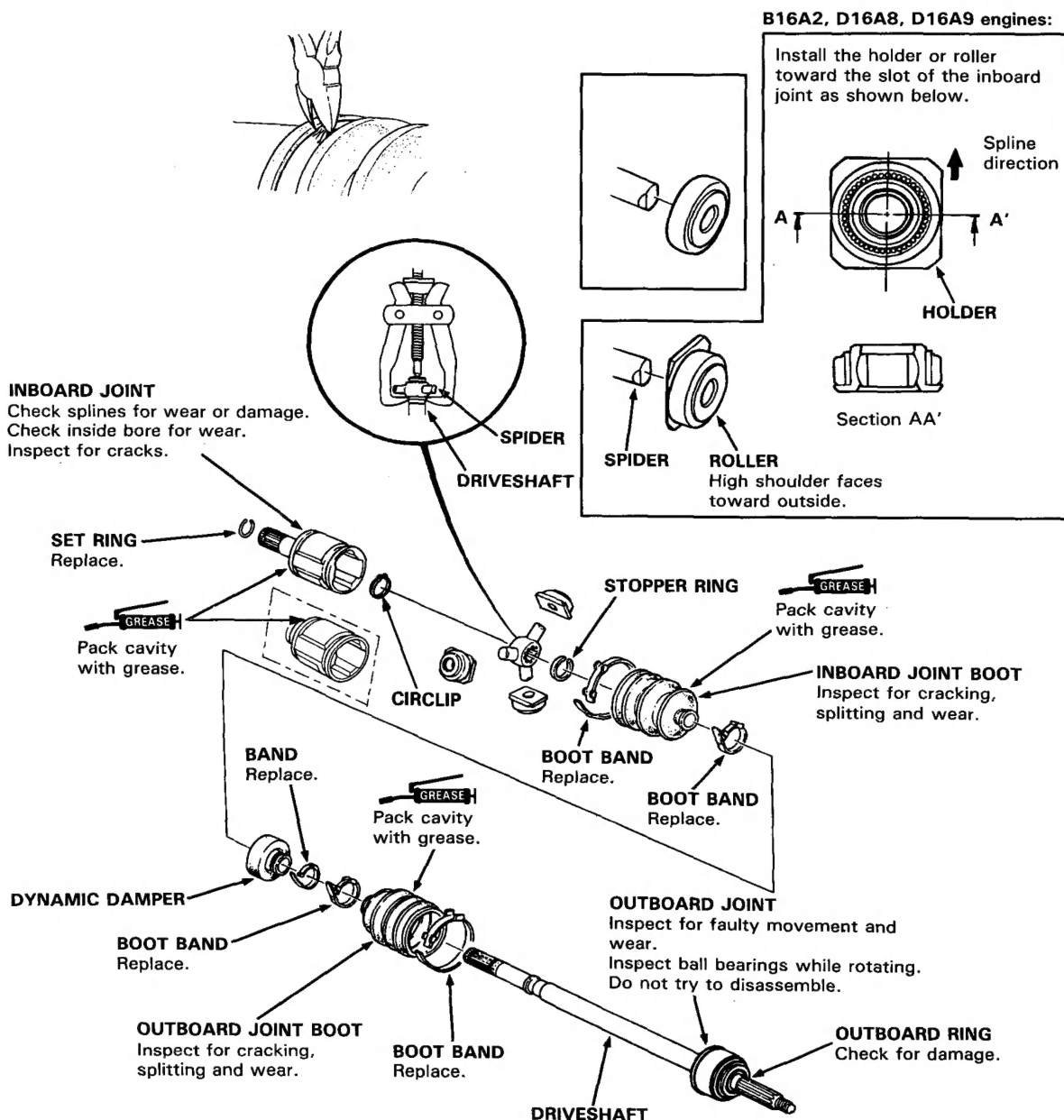
- Mark the rollers and roller grooves during disassembly to ensure proper positioning during reassembly.
- Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.
- The inboard joint must be removed to replace the boots.
- If the boot band is the welded type, cut off as shown.

CAUTION: Take care not to damage the boots.

GREASE Thoroughly pack the inboard joint and both joint boots with joint grease included in the new driveshaft set.

Grease Quantity:

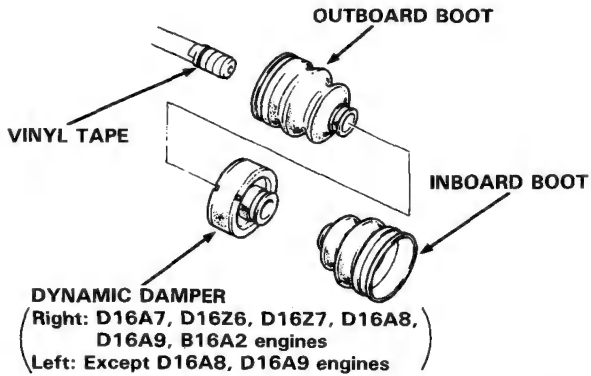
Inboard Joint	120–130 g (4.2–4.6 oz)
Outboard Joint	90–100 g (3.2–3.5 oz)



Front Driveshafts

Reassembly

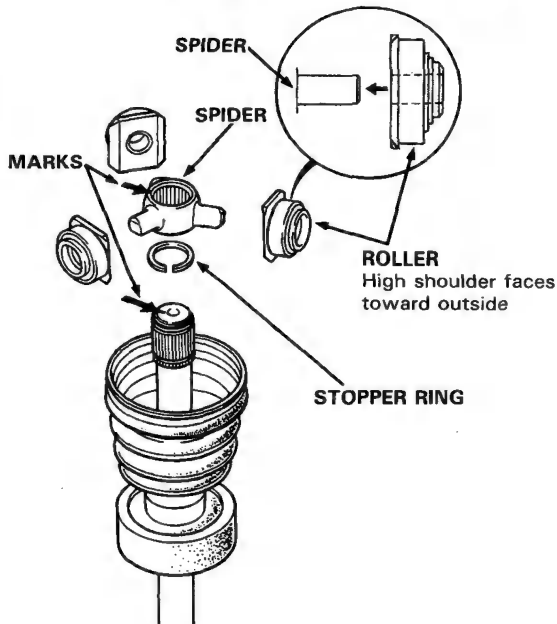
1. Wrap the splines with vinyl tape to prevent damage to the boots and dynamic damper.
2. Install the outboard boot, dynamic damper and inboard boot to the driveshaft, then remove the vinyl tape.



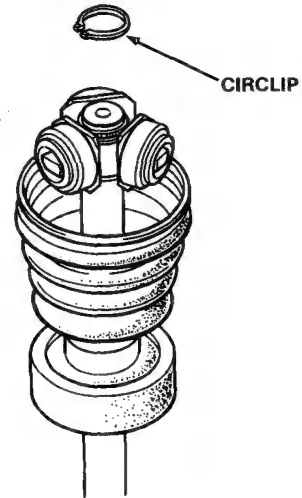
3. Install the stopper ring onto the driveshaft groove.
4. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.
5. Fit the rollers to the spider with their high shoulders facing outward.

CAUTION:

- Reinstall the rollers to their original positions on the spider.
- Hold the driveshaft assembly so the inboard joint points up, to prevent it from falling off.

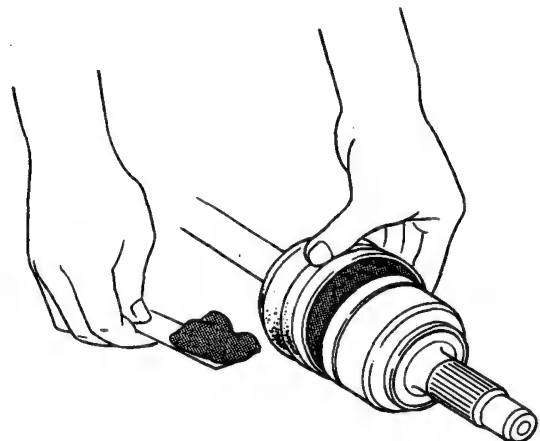


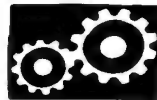
6. Fit the circlip onto the driveshaft groove.



7. Pack the outboard joint with the joint grease included in the new driveshaft set.

Grease Quantity: 90–100 g (3.2–3.5 oz)





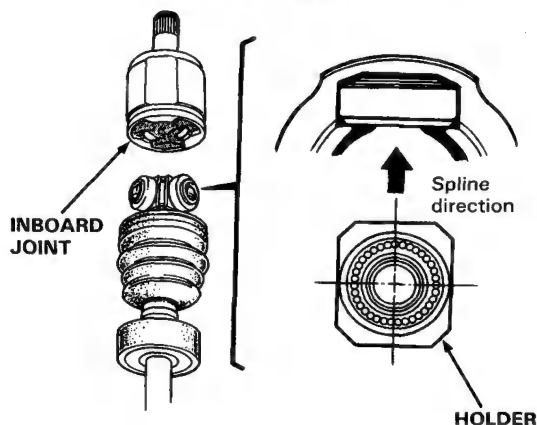
8. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease Quantity: 120 — 130 g (4.2 — 4.6 oz)

9. Fit the inboard joint onto the driveshaft.

CAUTION: To prevent it from falling off, hold the driveshaft assembly so the inboard joint points up.

D16A8, D16A9, B16A2 engines:
Align the holder direction of the rollers toward the slot of inboard joint as shown below.



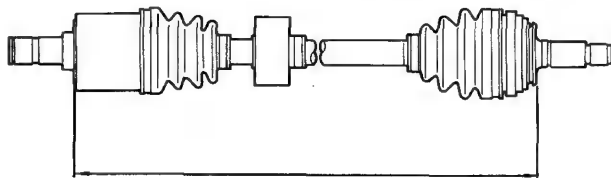
10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension.

NOTE: The ends of boots seat in the groove of the driveshaft and joint.

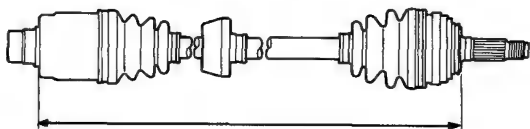
2WD:

Left

- Except 1.6 l DOHC:
773.1—778.1 mm (30.44—30.63 in)



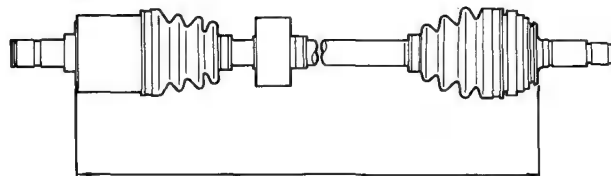
- D16A8, D16A9 engines:
500.6—505.6 mm (19.71—19.91 in)
- B16A2 engine:
475.1—480.1 mm (18.70—18.90 in)



- Right ● Except B16A2 engine:**
500.6—505.6 mm (19.71—19.91 in)

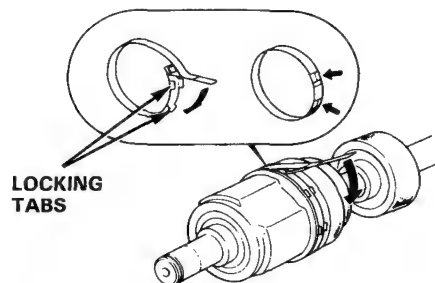
- B16A2 engine:
475.1—480.1 mm (18.70—18.90 in)

4WD: 496.1—501.1 (19.53—19.73 in)



11. Install new boot bands on the boot and bend both sets of locking tabs.

12. Lightly tap on the doubled-over portions to reduce their height.



13. With dynamic damper

- Position the dynamic damper as shown below.
- Lightly tap on the doubled over portion to reduce its height.
- Install a new dynamic damper band and bend down both sets of locking tabs.

- Left ● B16A2 engine:**

29±2 mm (1.1±0.08 in)

- Except D16A8, D16A9, B16A2 engines:
75±2 mm (3.0±0.08 in)

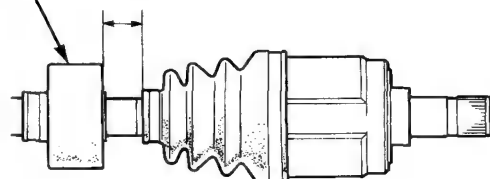
- Right ● B16A2 engine:**

29±2 mm (1.1±0.08 in)

- D16Z6, D16Z7, D16A8, D16A9 engines:
55±2 mm (2.2±0.08 in)

- 4WD: 49.5±2 mm (1.95±0.08 in)

DYNAMIC DAMPER



Front Driveshafts

Installation

1. Install the outboard joint in the knuckle, then loosely install the spindle nut.
2. Apply 1 – 1.5 g (0.03 – 0.05 oz) of specified grease to the whole spline surface of the intermediate shaft.

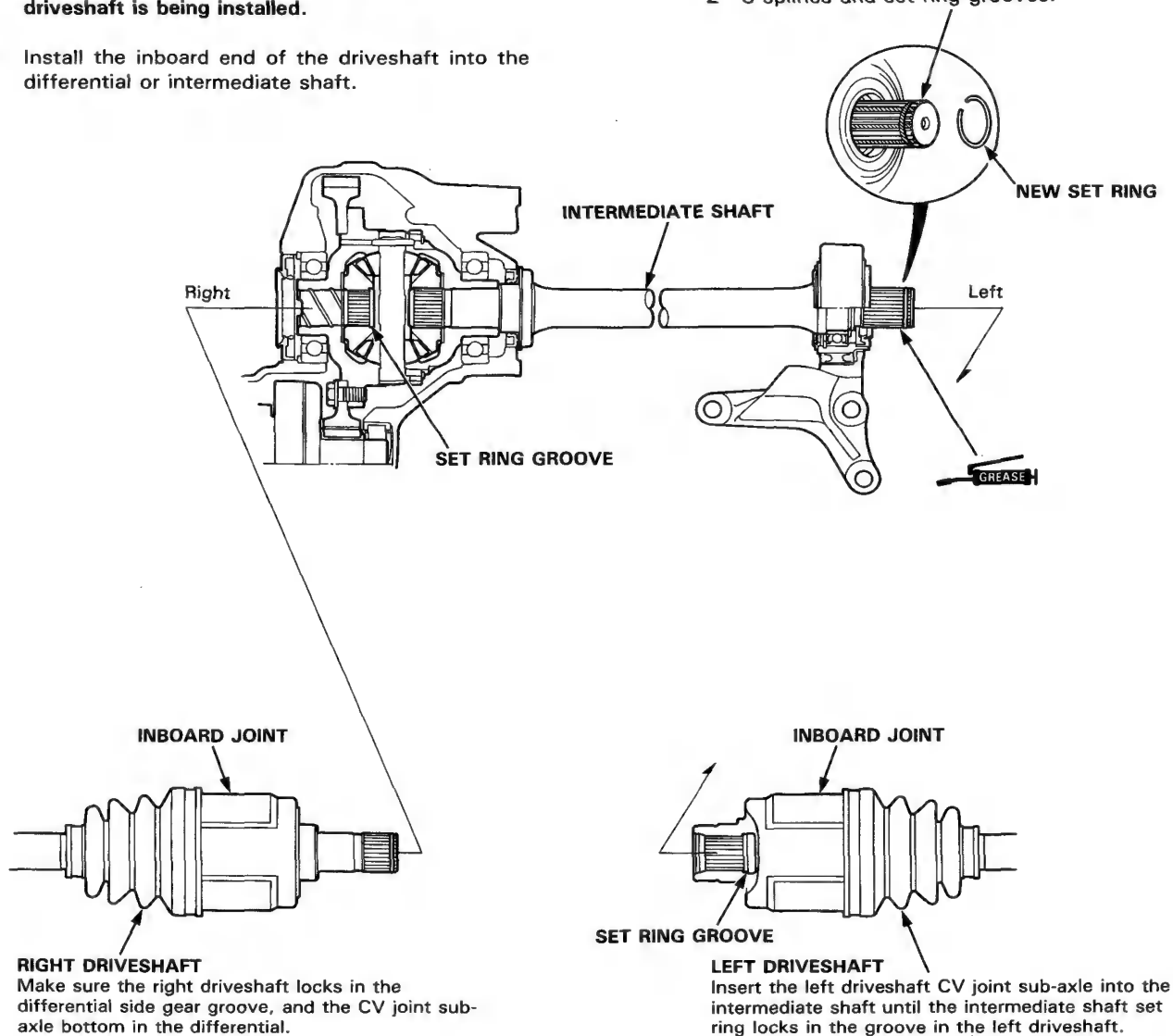
NOTE: After applying grease, remove the grease from the spline grooves at interval of 2–3 splines and set ring groove for air bleeding in the inboard joint.

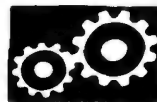
3. Install the new set ring onto the driveshaft or intermediate shaft groove.

CAUTION: Always use a new set ring whenever the driveshaft is being installed.

4. Install the inboard end of the driveshaft into the differential or intermediate shaft.

NOTE: After applying grease, remove the grease from the spline grooves at interval of 2–3 splines and set ring grooves.





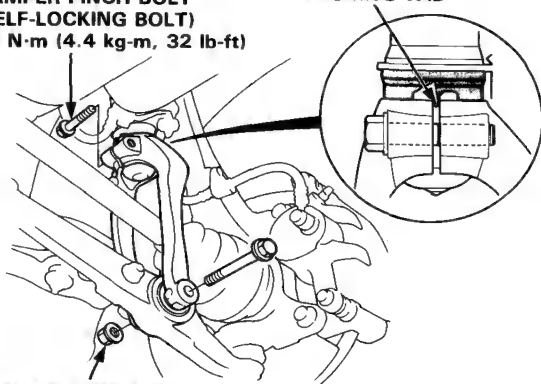
3. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.

4. Loosely install the damper pinch bolt and the new damper fork nut.

NOTE: The bolts and nut should be tightened with the vehicle's weight on the damper.

**DAMPER PINCH BOLT
(SELF-LOCKING BOLT)**
44 N·m (4.4 kg-m, 32 lb-ft)

ALIGNING TAB



**DAMPER FORK NUT
(SELF-LOCKING NUT)**
65 N·m (6.5 kg-m, 47 lb-ft)

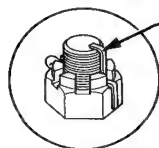
5. Install the knuckle on the lower arm, then tighten the castle nut and install new cotter pin.

CAUTION:

- Be careful not to damage the ball joint boot.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

COTTER-PIN

On reassembly,
bend the cotter pin
as shown.



CASTLE NUT
12 x 1.25 mm

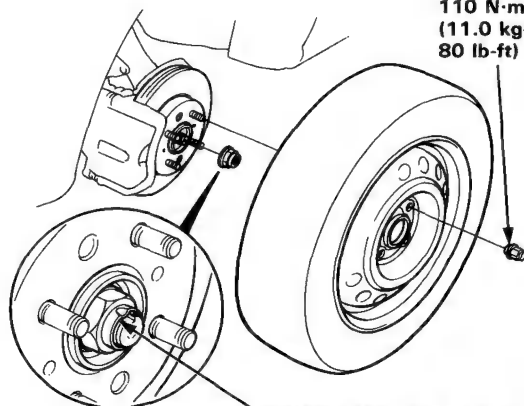
50–60 N·m (5.6–6.0 kg-m, 36–43 lb-ft)

6. Tighten the new spindle nut.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

7. Install the wheel with the wheel nuts.

WHEEL NUT
12 x 1.5 mm
110 N·m
(11.0 kg-m,
80 lb-ft)



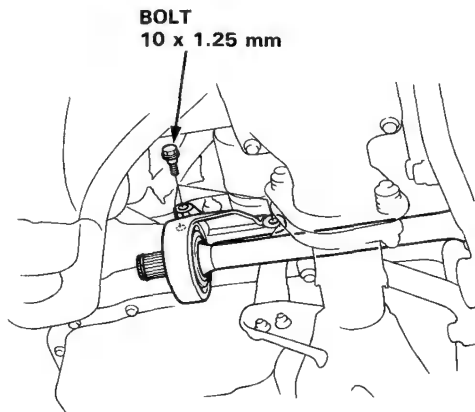
SPINDLE NUT 22 x 1.5 mm
185 N·m (18.5 kg-m, 134 lb-ft)
B16A2 engine: 24 x 1.5 mm
250 N·m (25 kg-m, 181 lb-ft)
After tightening, use a drift to
stake spindle nut shoulder
against the driveshaft.

8. Tighten the damper pinch bolt and the new damper fork nut (see step 4).
9. Refill the transmission (see Section 15).
10. Check the front wheel alignment and adjust if necessary (see 18-4).

Intermediate Shaft

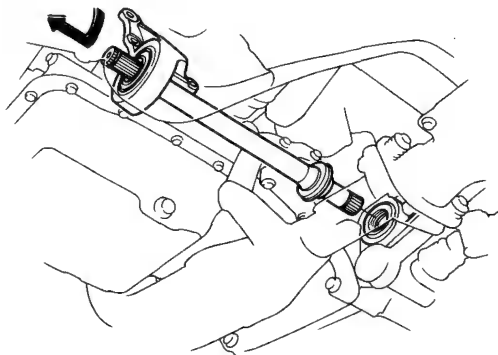
Replacement

1. Drain the transmission oil. (see Section 15)
2. Remove the left driveshaft assembly (page 16-6).
3. Remove the three bolts.

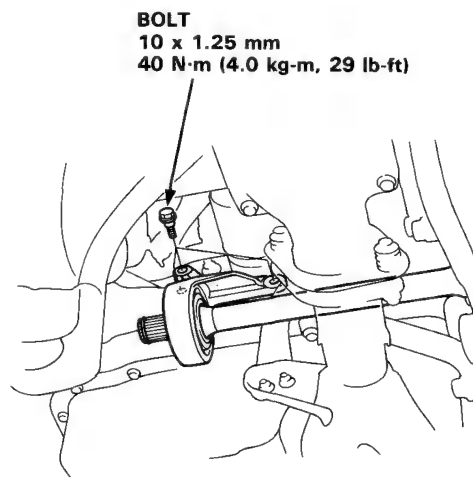


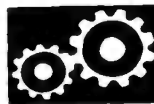
4. Remove the intermediate shaft assembly from the differential.

CAUTION: To prevent damage to the differential oil seal, hold the intermediate shaft horizontal until it is clear of the differential.



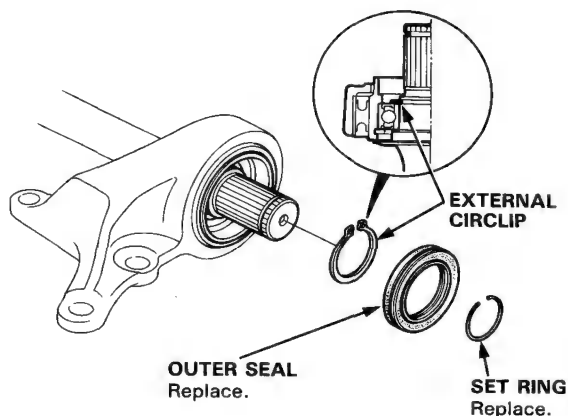
5. Installation is the reverse order of removal.



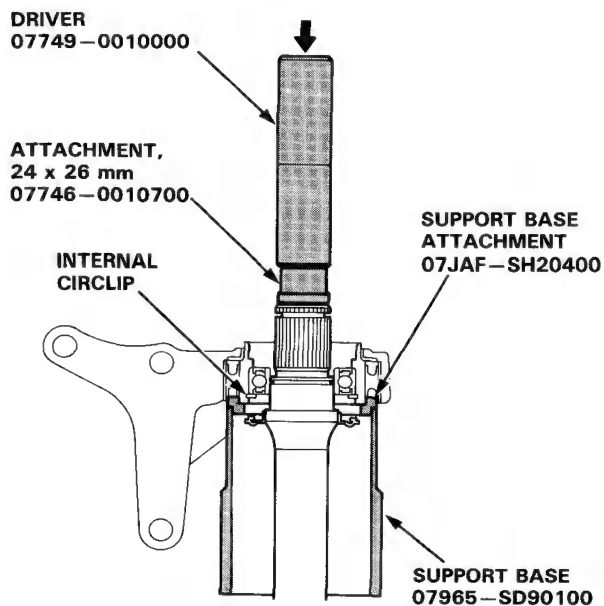


Disassembly

1. Remove the set ring.
2. Remove the intermediate shaft outer seal from the bearing support.
3. Remove the external circlip.



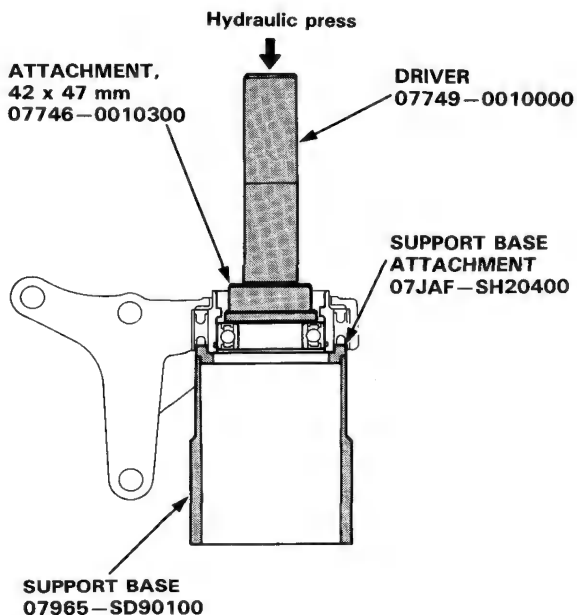
4. Press the intermediate shaft out of the shaft bearing using the special tools and hydraulic press as shown.



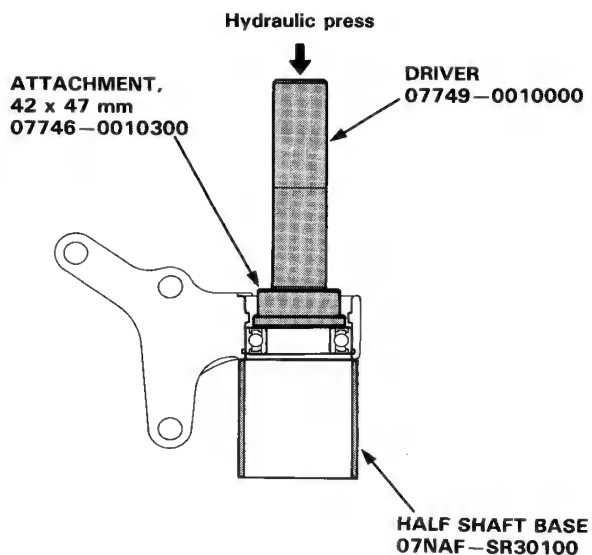
5. Remove the internal circlip.

6. Press the intermediate shaft bearing out of the bearing support using the special tools and hydraulic press as shown.

B16A2 engine:



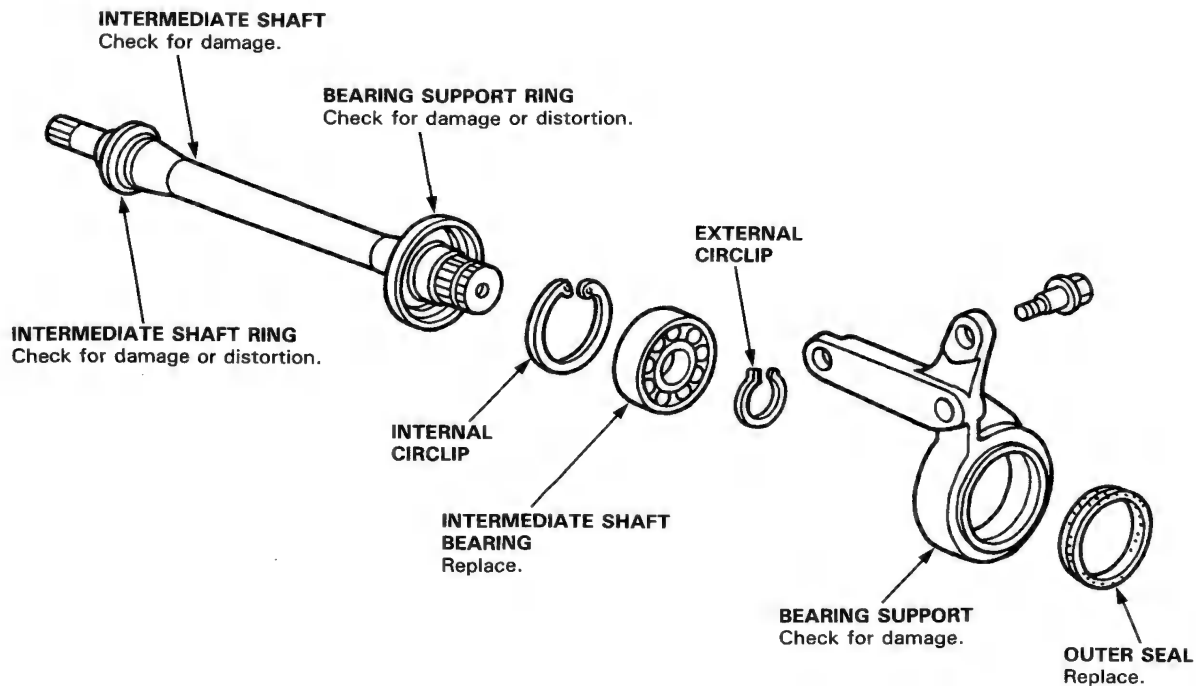
Except B16A2 engine:

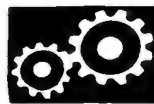


Intermediate Shaft

Index/Inspection

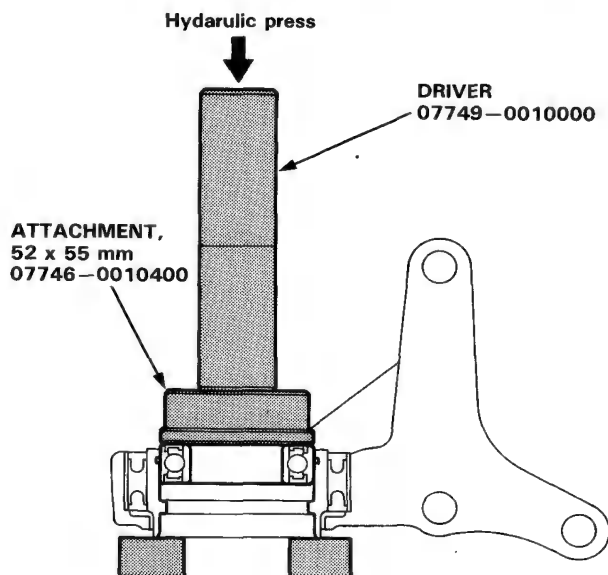
CAUTION: Do not damage the lip on outer seals during installation.





Reassembly

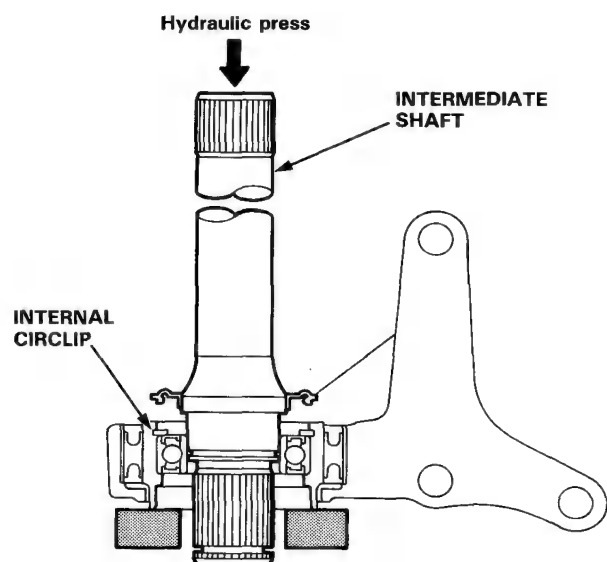
1. Press the intermediate shaft bearing into the bearing support using the special tools and hydraulic press as shown.



2. Seat the internal circlip in the groove of the bearing support.

CAUTION: Install the circlip with the tapered end facing out.

3. Press the intermediate shaft into the shaft bearing using a hydraulic press as shown.

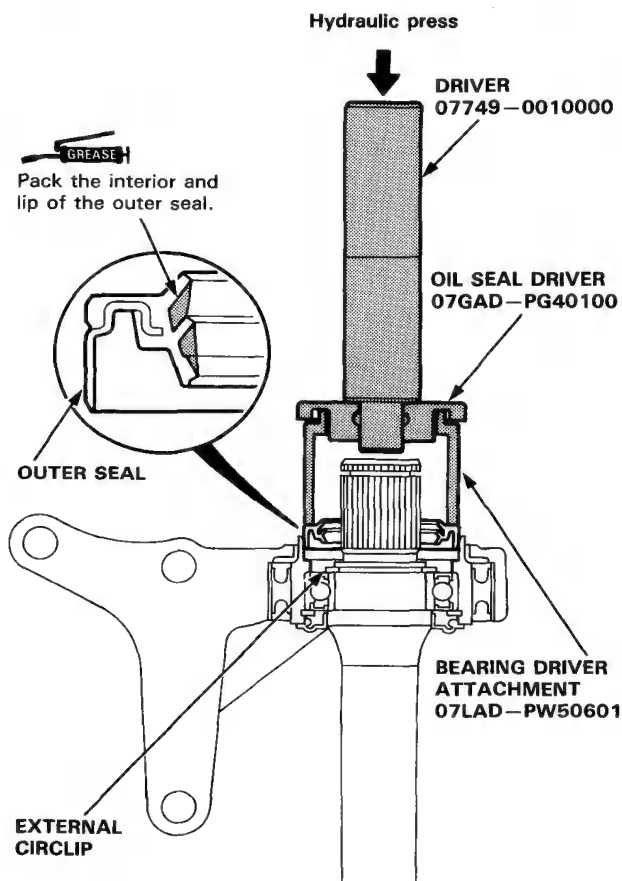


4. Seat the external circlip in the groove of the intermediate shaft.

CAUTION: Install the circlip with the tapered end facing out.

5. Press the outer seal into the bearing support using the special tools and hydraulic press as shown.

NOTE: Press the seal flush with the bearing support.



6. Install the new set ring in the intermediate shaft groove.

Rear Driveshafts

Removal

INSPECTION

Driveshaft Boot

Check the boots on the driveshaft for cracks, damage, leaking grease or loose boot bands.

If any damage is found, replace the boot.

Spline Looseness

Turn the driveshaft by hand and make sure the spline and joint are not excessively loose.

If damage is found, replace the inboard joint.

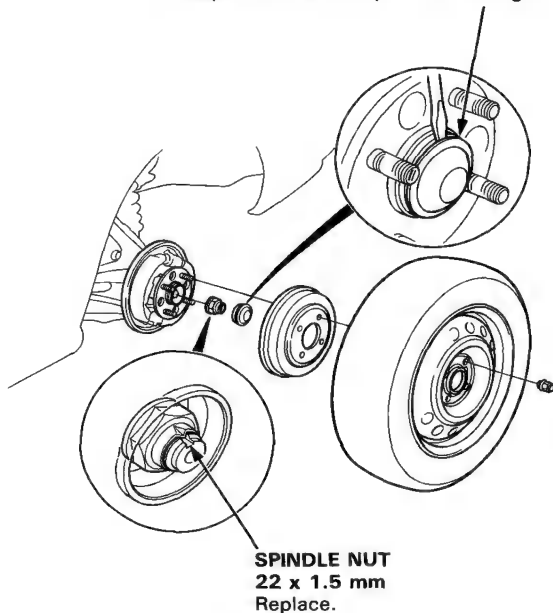
Twisted or Cracked

Make sure the driveshaft is not twisted or cracked. Replace if necessary.

1. Raise the car and place safety stands in the proper locations (see section 1).
2. Remove the rear wheel.
3. Remove the brake drum.
4. Remove the hub cap, then raise the locking tab on the spindle nut, then remove the nut.

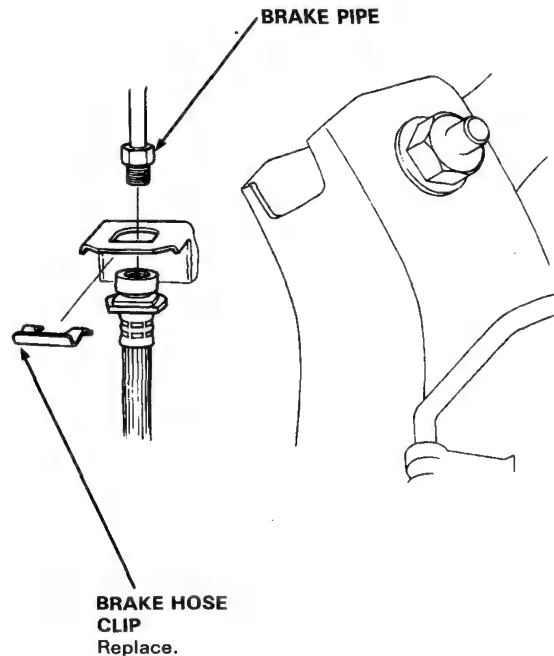
HUB CAP

NOTE: Take care not to damage the hub cap and hub unit on disassembly. Replace the hub cap if it is damaged.



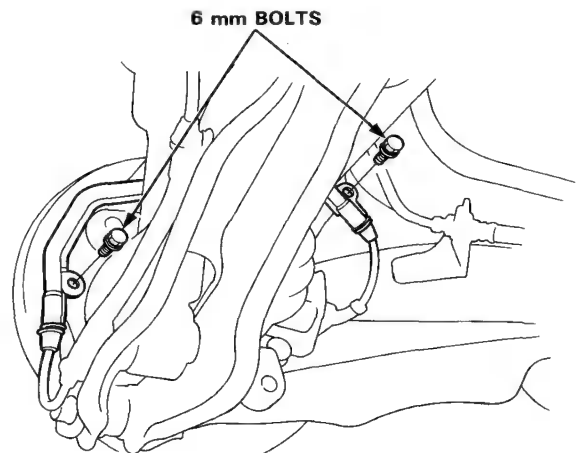
5. Disconnect the brake hose from the brake pipe using a 10 mm flare nut wrench.

CAUTION: Avoid spilling brake fluid on painted surfaces as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.



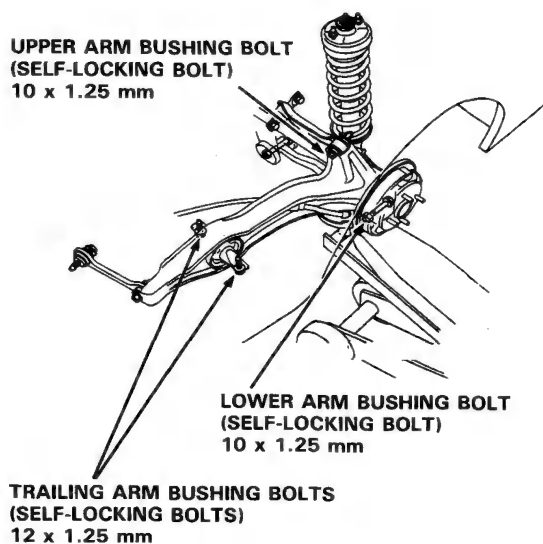
6. Remove the speed sensor wire bracket.

NOTE: Do not disconnect the speed sensor wire.

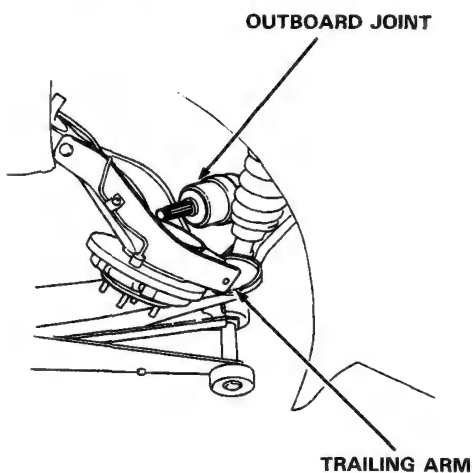




7. Raise the rear suspension with a floor jack until the weight of the lower arm is relieved.
8. Remove the trailing arm bushing bolts.
9. Disconnect the upper arm and lower arm from the trailing arm.



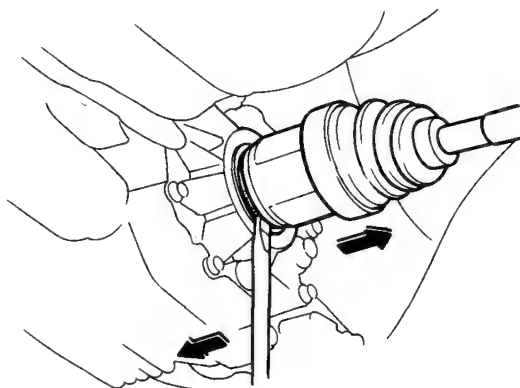
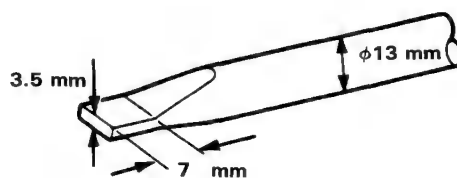
10. Pull the trailing arm outward and remove the rear driveshaft outboard joint from the trailing arm using a plastic hammer.



11. Pry the driveshaft assembly with a screwdriver as shown to force the set ring at the driveshaft end past the groove.
12. Pull the inboard joint and remove the driveshaft and CV joint out of the differential case as an assembly.

CAUTION:

- Do not pull on the driveshaft, or the CV joint may come apart.
- Use care when prying out the assembly and pull it straight to avoid damaging the differential oil seal.



Rear Driveshafts

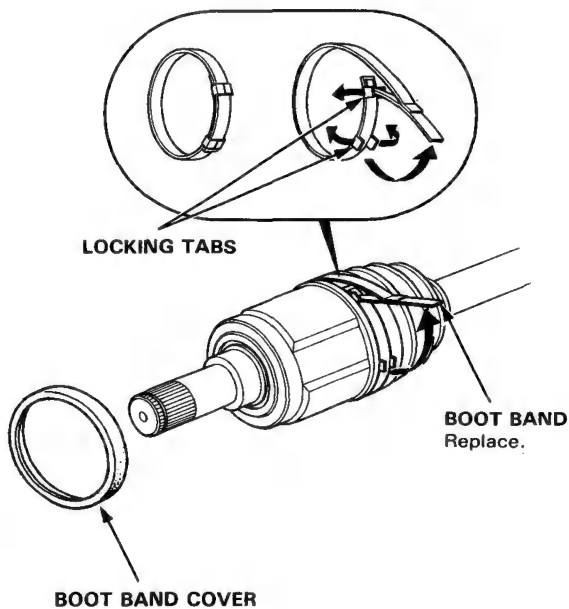
Disassembly

1. To remove the boot band, pry up the locking tabs with a screwdriver and raise the end of the band.

NOTE: Carefully clamp the driveshaft in a vise with soft jaws.

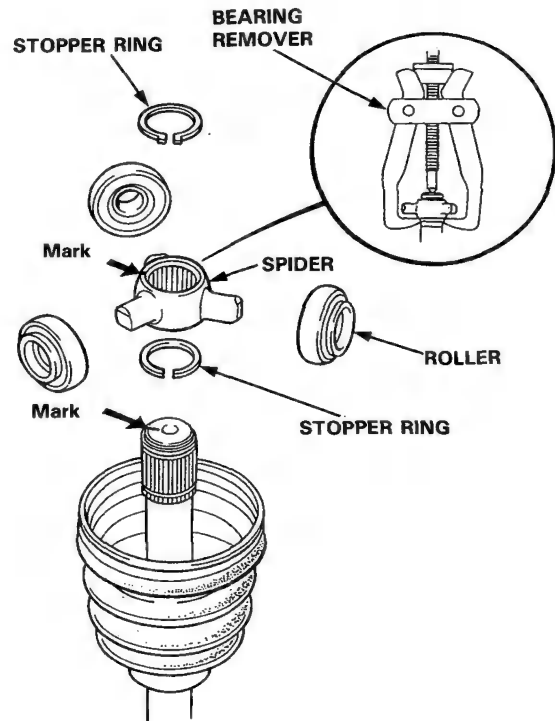
CAUTION: Take care not to damage the boots.

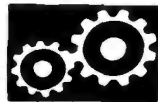
2. Remove the boot band cover.



3. Remove the inboard joint and rollers.
4. Remove the stopper ring, then remove the spider using a commercially available bearing remover.

NOTE: Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.





Disassembly/Inspection

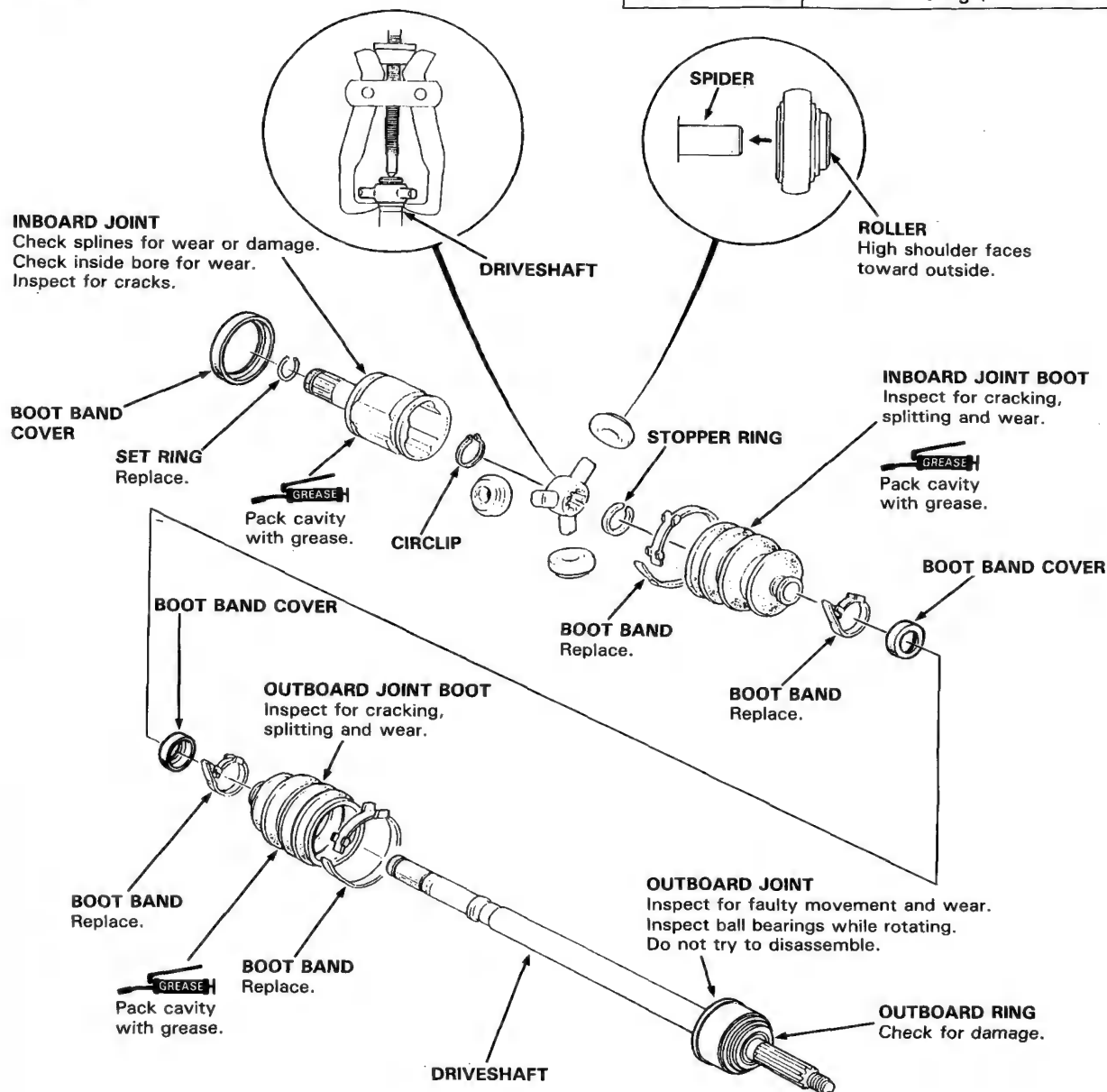
NOTE:

- Mark the rollers and roller grooves during disassembly to ensure proper positioning during reassembly.
- Before disassembly, mark the spider and driveshaft so they can be reinstalled in their original positions.
- The inboard joint must be removed to replace the boots.

GREASE Thoroughly pack the inboard joint and both joint boots with joint grease included in the new driveshaft set.

Grease Quantity:

Inboard Joint	100–110 g (3.5–3.9 oz)
Outboard Joint	70–80 g (2.5–2.8 oz)



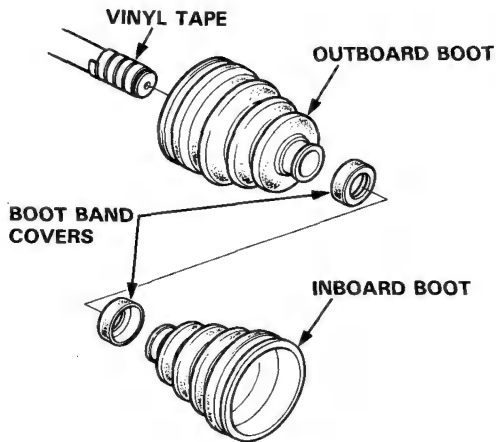
Rear Driveshafts

Reassembly

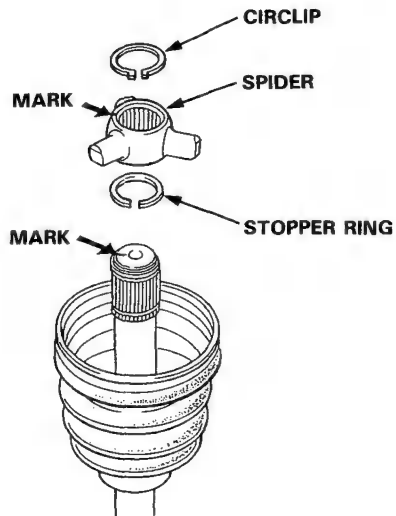
CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.

1. Wrap the splines with vinyl tape to prevent damage to the boots and covers.
2. Install the outboard boot, boot band covers and inboard boot to the driveshaft, then remove the vinyl tape.



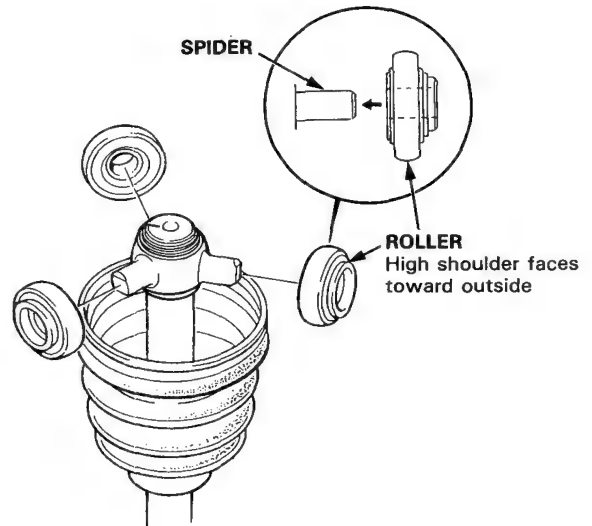
3. Install the stopper ring onto the driveshaft groove.
4. Install the spider on the driveshaft by aligning the marks on the spider end of the driveshaft.
5. Fit the circlip onto the driveshaft groove.



6. Fit the rollers to the spider with their high shoulders facing outward.

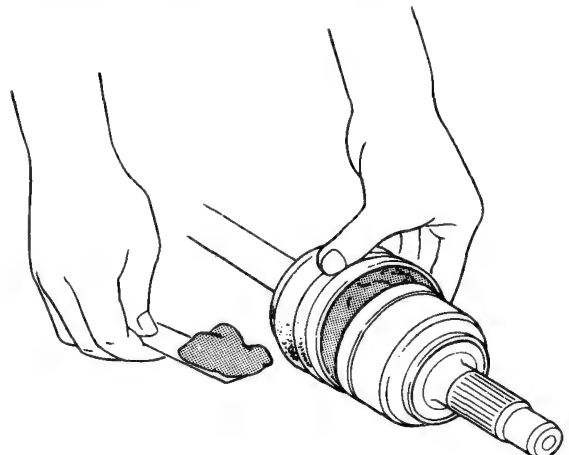
CAUTION:

- Reinstall the rollers to their original positions on the spider.
- Hold the driveshaft assembly so the inboard joint points up, to prevent it from falling off.



7. Pack the outboard joint with the joint grease included in the new driveshaft set.

Grease Quantity: 70–80 g (2.5–2.8 oz)





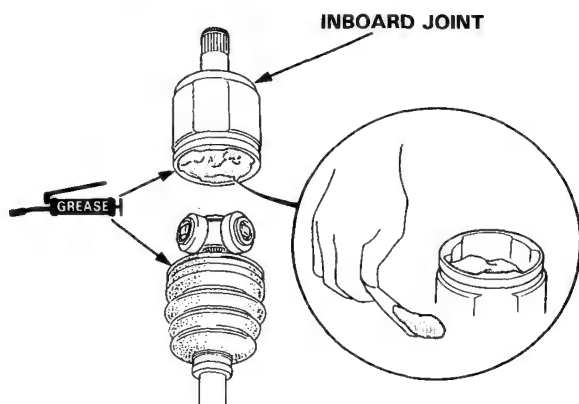
8. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease Quantity: 100–110 g (3.5–3.9 oz)

9. Fit the inboard joint onto the driveshaft.

CAUTION:

Hold the driveshaft assembly so the inboard joint points up, to prevent it from falling off.



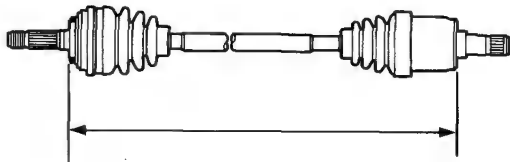
10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension.

NOTE:

The ends of boots seat in the groove of the driveshaft and joint.

Left: 629.9–634.9 mm (24.80–25.00 in)
INTRAC: 623.9–628.9 mm
(24.56–24.76 in)

Right: 583.9–588.9 mm (22.99–23.18 in)
INTRAC: 541.9–546.9 mm
(21.33–21.53 in)

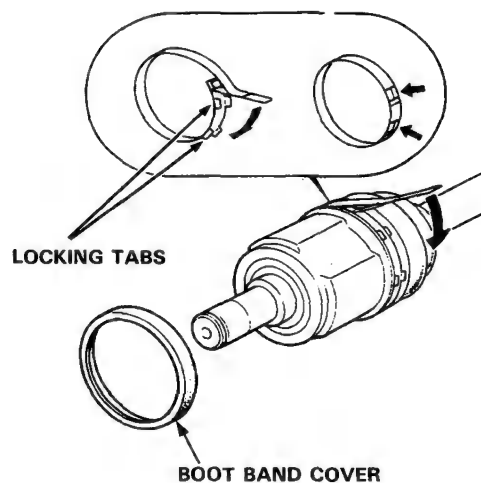


11. Install new boot bands on the boot and bend both sets of locking tabs.

12. Lightly tap on the doubled-over portions to reduce their height.

13. Install the boot band cover.

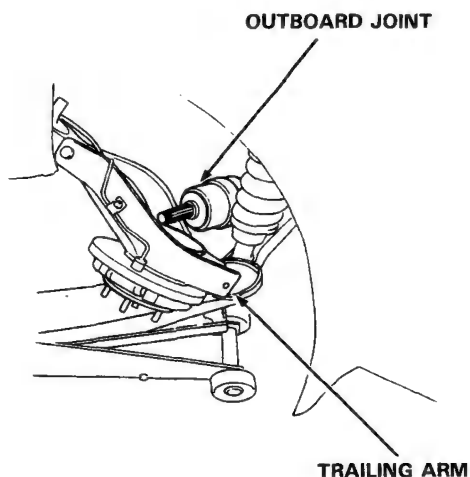
14. Install a new set ring in the driveshaft groove.



Rear Driveshafts

Installation

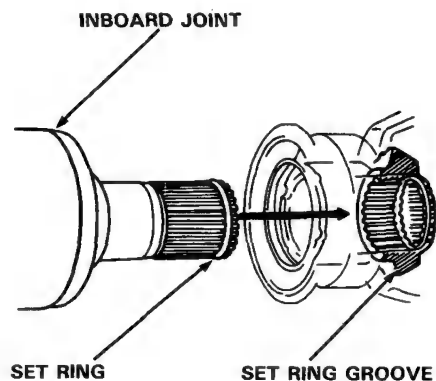
1. Install the outboard joint in the trailing arm.



2. Install the inboard end of the driveshaft into the differential.

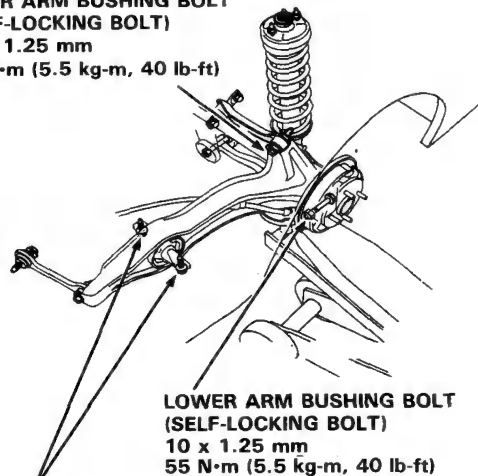
CAUTION:

- Always use a new set ring whenever the driveshaft is being installed.
- Make sure the driveshaft locks in the differential side gear groove, and the CV joint subaxle bottoms in the differential.



3. Raise the rear suspension with a floor jack until the weight of the lower arm is relieved.
4. Connect the upper arm and lower arm with trailing arm, then tighten the trailing arm bushing bolts.

UPPER ARM BUSHING BOLT
(SELF-LOCKING BOLT)
10 x 1.25 mm
55 N·m (5.5 kg-m, 40 lb-ft)

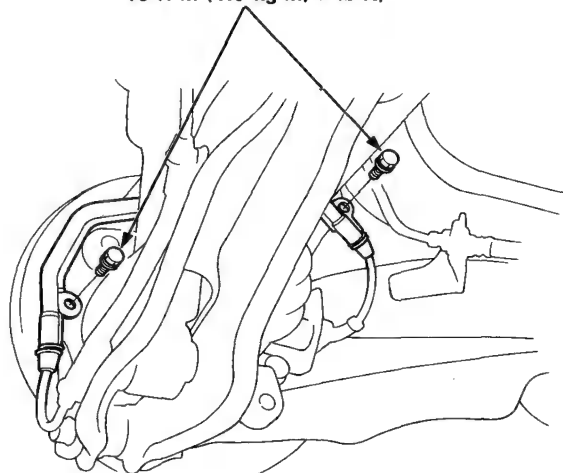


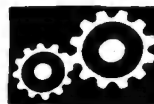
LOWER ARM BUSHING BOLT
(SELF-LOCKING BOLT)
10 x 1.25 mm
55 N·m (5.5 kg-m, 40 lb-ft)

TRAILING ARM BUSHING BOLTS
(SELF-LOCKING BOLTS)
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

5. Install the speed sensor wire bracket.

6 mm BOLTS
10 N·m (1.0 kg-m, 7 lb-ft)

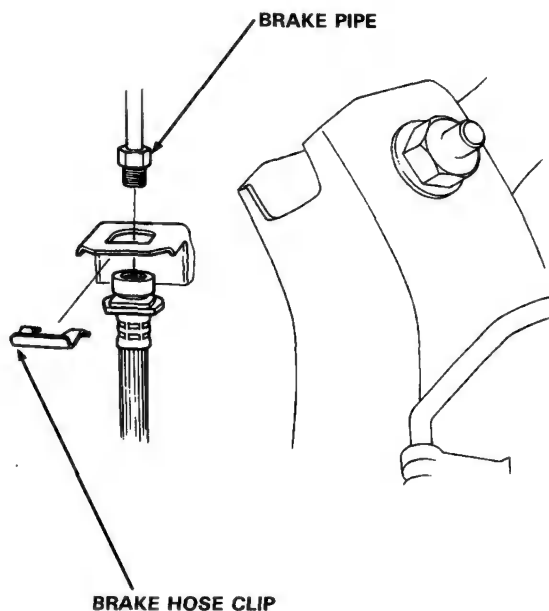




6. Connect the brake hose to the brake pipe using a 10 mm flare nut wrench, then install the new brake hose clip.

CAUTION:

- Use only clean brake fluid.
- Make sure that no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Avoid spilling brake fluid on painted surfaces as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.



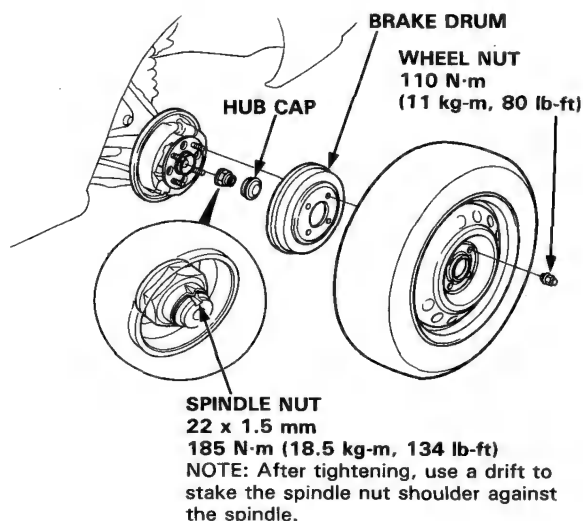
7. Install the new spindle nut, then tighten it.

8. Install the hub cap.

9. Install the brake drum.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

10. Install the wheel with the wheel nut.



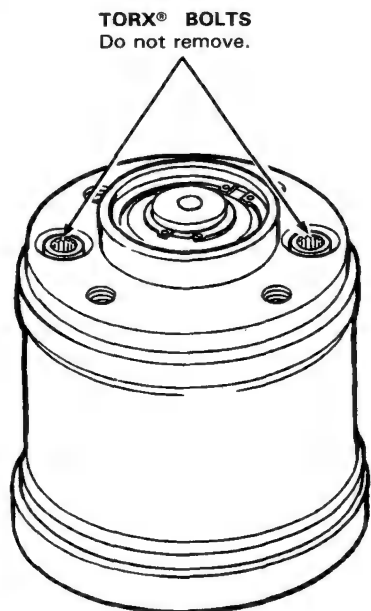
11. Check the rear wheel alignment and adjust if necessary (see 18-5).

Propeller Shafts

Viscous Coupling Precaution

The viscous coupling unit contains no serviceable or replaceable parts. If it is found to be faulty (fails the stall test or shows signs of leakage), it must be replaced as a unit.

Do not remove the TORX® bolts from the viscous coupling.



Inspection

Shaft Runout

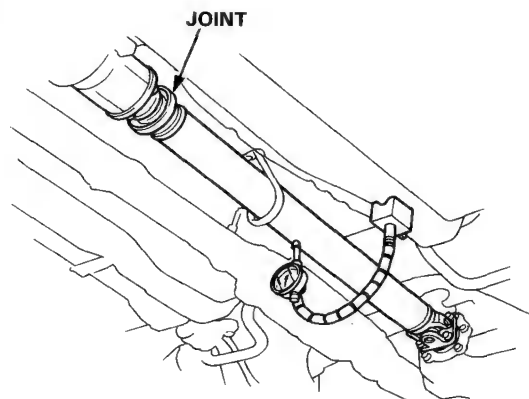
1. Put the transmission in neutral for manual transmission models, and in P for automatic transmission models.
2. Raise the car off the ground and support with safety stands in proper positions.
3. Install a dial indicator with the indicator contacting the center of the No. 1 or No. 3 (INTRAC: No. 2) propeller shaft.
4. With someone holding either rear wheel, rotate the other wheel and check the runout.

Propeller Shaft

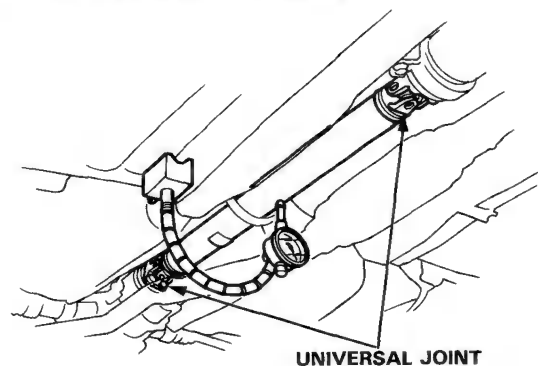
Runout:

Service Limit: 1.5 mm (0.06 in)

No. 1 Propeller shaft:

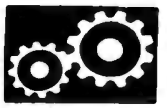


No. 3 (INTRAC: No.2) Propeller shaft:



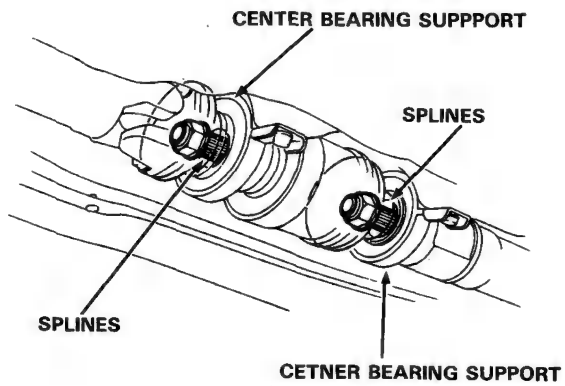
Universal Joint • Joint • Boot

- Check each universal joint for excessive play or rattle.
- Check for loose joints or connections.
- Check the boot for cracking, splitting or other faults.



Splines/Center Bearing Support

1. Raise the car off the ground and support with safety stands in proper positions.
2. Inspect the shaft splines for excessive play or rattle.
3. Inspect the center bearing support for play.



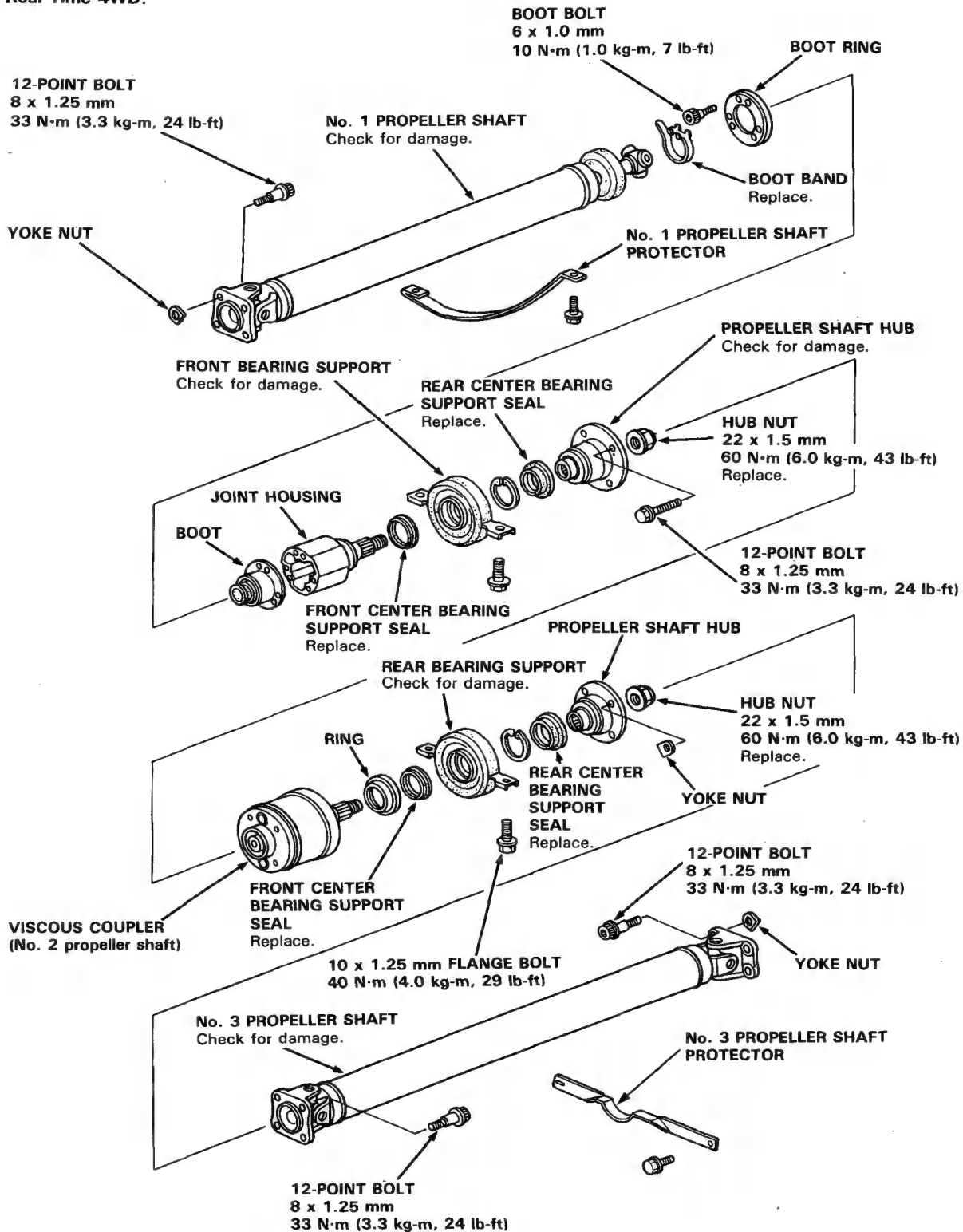
Viscous Coupling

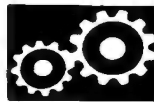
- See Section 15.

Propeller Shafts

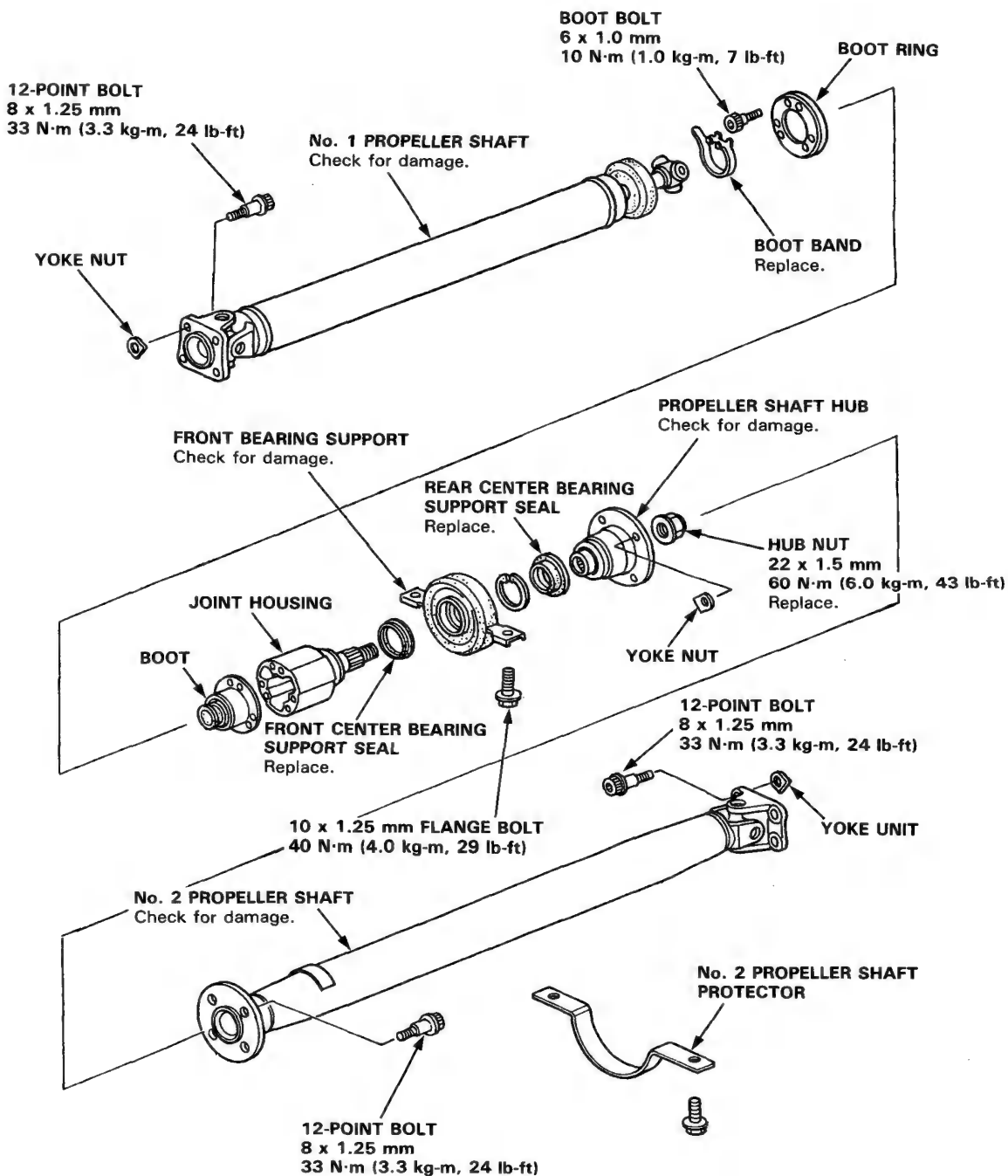
Index/Inspection

Real Time 4WD:





Real Time INTRAC 4WD:



Propeller Shafts

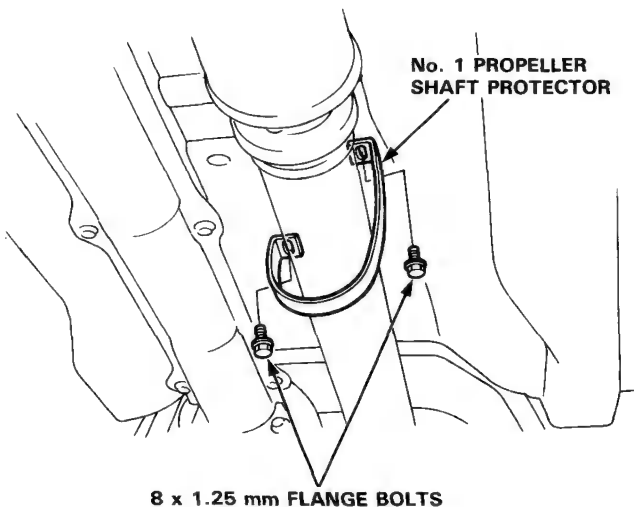
Removal

● No. 1 Propeller Shaft

NOTE:

Mark the shafts and joints for reassembly.

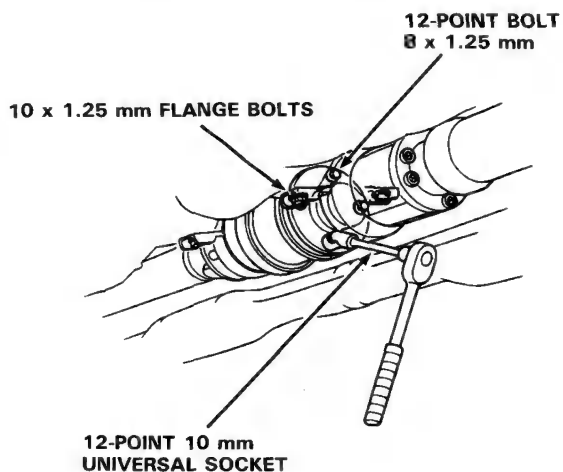
1. Remove the No. 1 propeller shaft protector.



2. Disconnect the No. 1 propeller shaft and viscous coupling (No. 2 propeller shaft).
3. Remove the front center bearing support from the body.

NOTE:

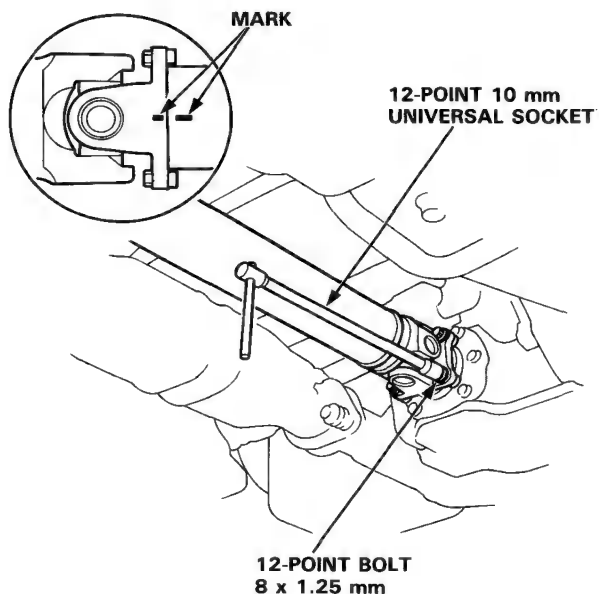
Use 12 point Box Wrench for other portions.



4. Remove the No. 1 propeller shaft.

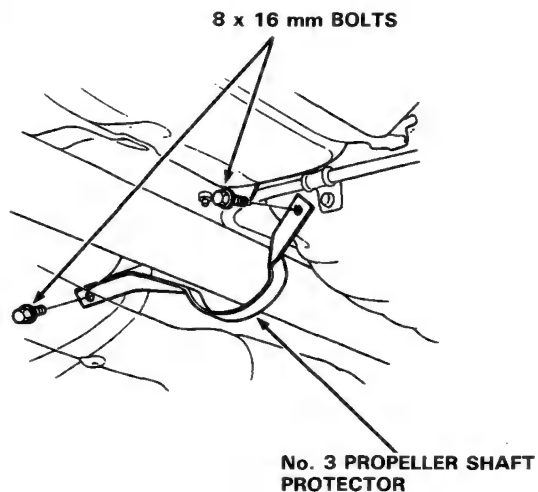
NOTE:

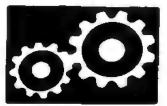
Use 12 Point Box Wrench for other portions.



● Viscous Coupling (No. 2 Propeller Shaft) and No. 3 Propeller Shaft.

5. Remove the No. 3 (INTRAC: No. 2) propeller shaft protector.

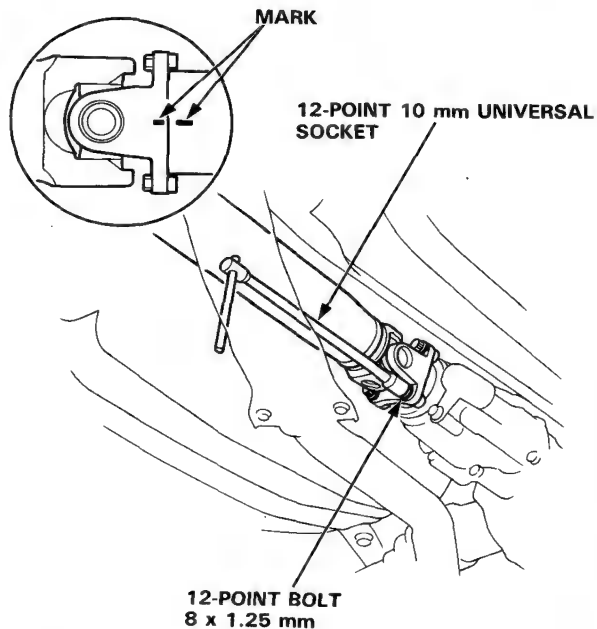




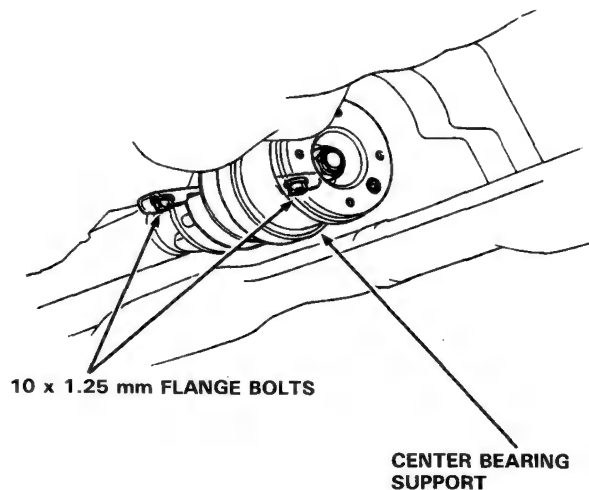
6. Disconnect the No. 3 (INTRAC: No. 2) propeller Shaft and rear differential.

NOTE:

Use 12 Point Box Wrench for other portions.



7. Remove the rear center bearing support from the body, then remove the viscous coupling (No. 2 Propeller shaft) and No. 3 propeller shaft (Except INTRAC).

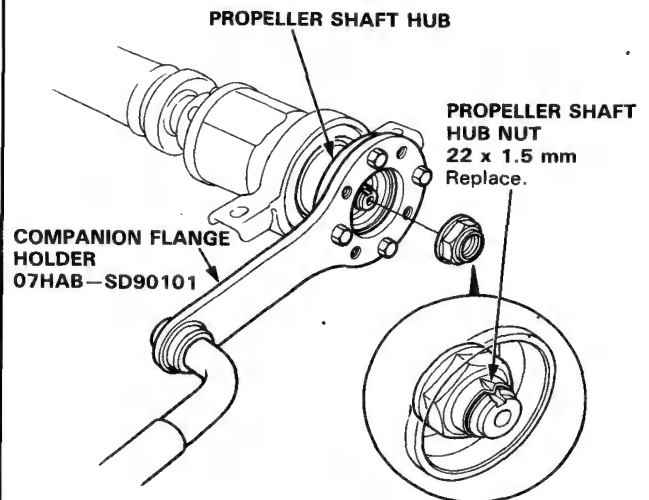


No. 1 Propeller Shaft Disassembly

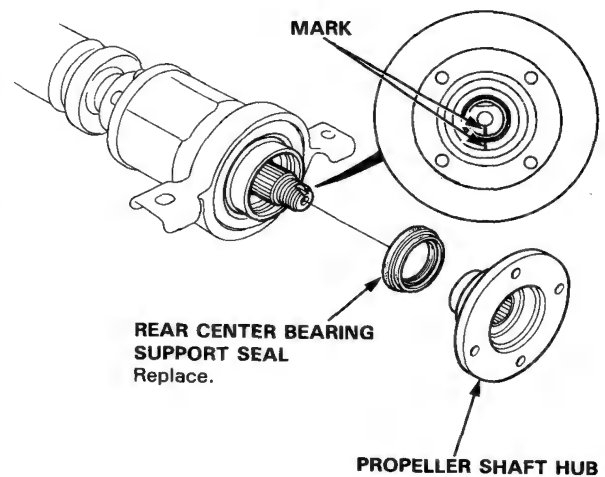
NOTE:

Make the shaft and hub before disassembly.

1. Remove the hub nut from the No. 1 propeller shaft using the special tool to prevent the shaft from turning.
2. Remove the propeller shaft hub.



3. Remove the rear center bearing support seal.

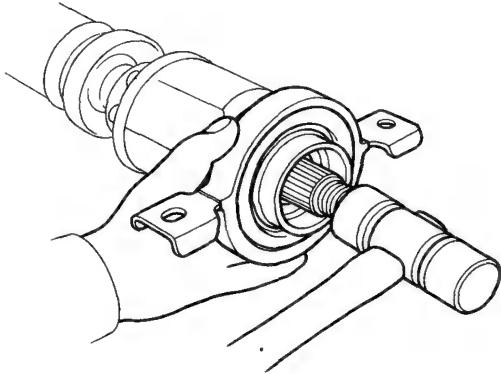


(cont'd)

Propeller Shafts

No. 1 Propeller Shaft Disassembly (cont'd)

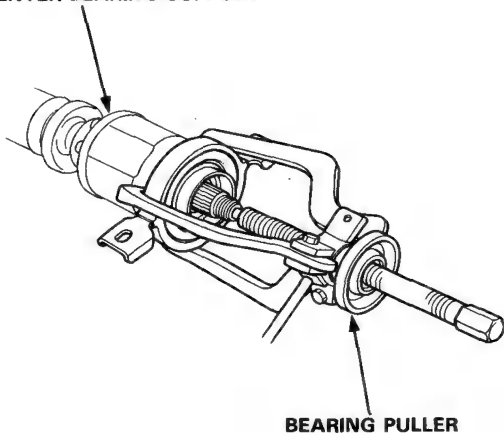
4. Holding the center bearing support with one hand, lightly tap on the shaft end with a soft hammer until the shaft is clear of the bearing support.



NOTE:

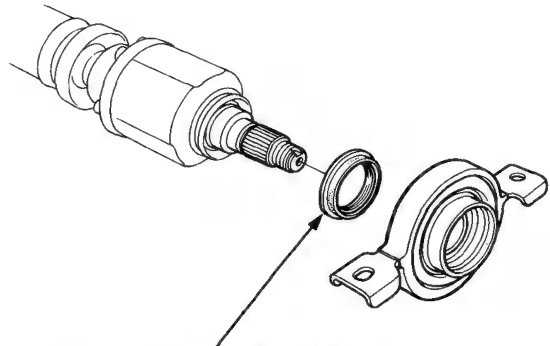
If difficulty is encountered in removing the shaft, use a puller. Replace the bearing support with a new one when a puller is used to remove it.

CENTER BEARING SUPPORT



BEARING PULLER

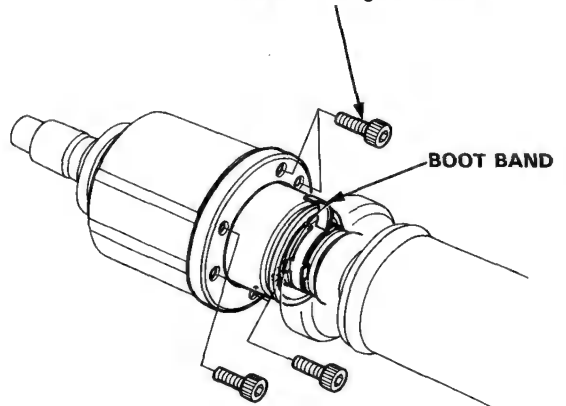
5. Remove the front center bearing support seal.



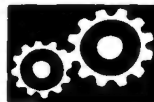
FRONT CENTER BEARING
SUPPORT SEAL
Replace.

6. Unscrew the boot bolts from the joint housing of the No. 1 propeller shaft.

BOOT BOLT
6 x 1.0 mm
10 N·m (1.0 kg-m, 7 lb-ft)



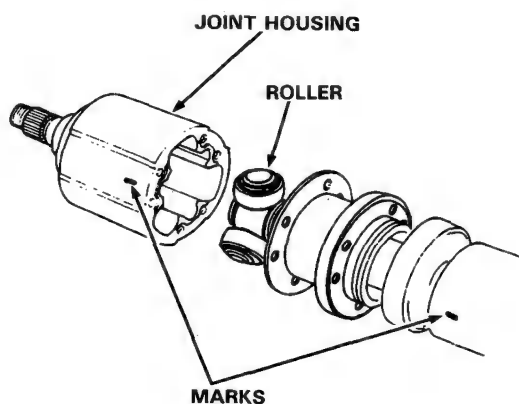
BOOT BAND



7. Pull the joint housing off propeller shaft.

NOTE:

- Mark the housing and shaft before separating them.
- Be careful not to let the rollers fall off the spider during disassembly.

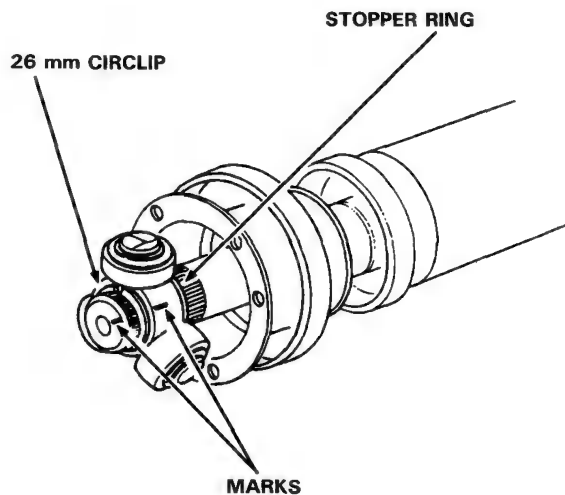


8. Pry off the 26 mm circlip and separate the spider from the propeller shaft.

NOTE:

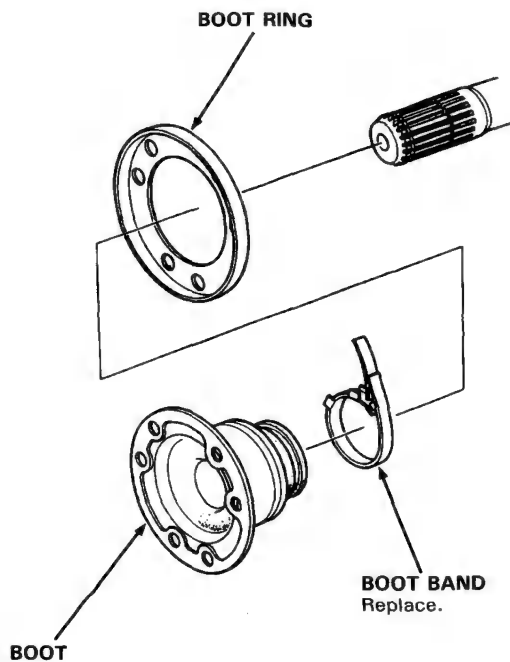
Mark the spider and shaft before separating them.

9. Remove the stopper ring.



10. Raise the boot band locking tabs.

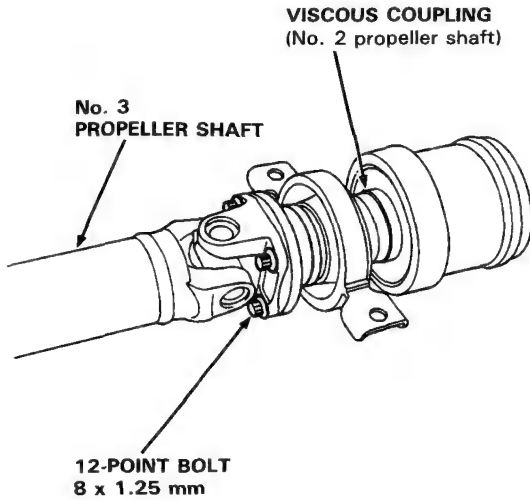
11. Remove the boot, boot band and boot ring from the propeller shaft.



Propeller Shafts

Viscous Coupler (No. 2 Propeller Shaft), No. 3 Propeller Shaft Disassembly —

1. Remove the viscous coupling (No. 2 propeller shaft) from the No. 3 propeller shaft.

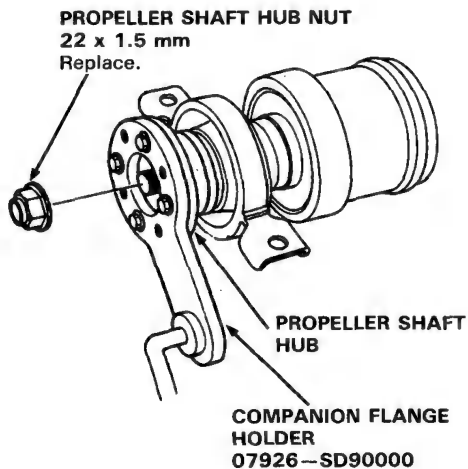


2. Remove the hub nut from the viscous coupling (No. 2 propeller shaft) using the special tool to prevent the shaft turning.

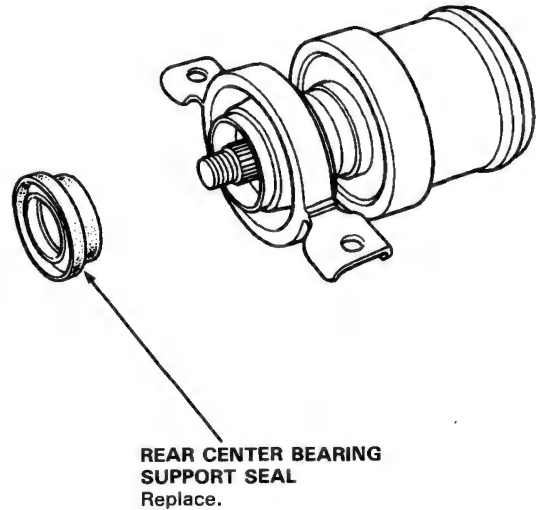
NOTE:

Mark the shaft and hub before disassembly.

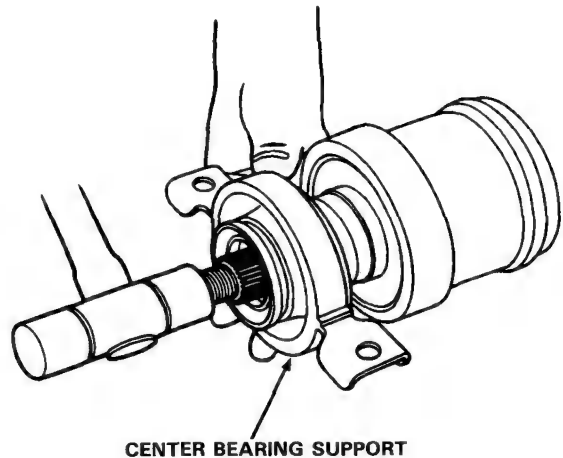
3. Remove the propeller shaft hub.



4. Remove the rear center bearing support seal.



5. Holding the center bearing support with one hand, lightly tap on the shaft end with a soft hammer until the shaft is clear of the bearing support.



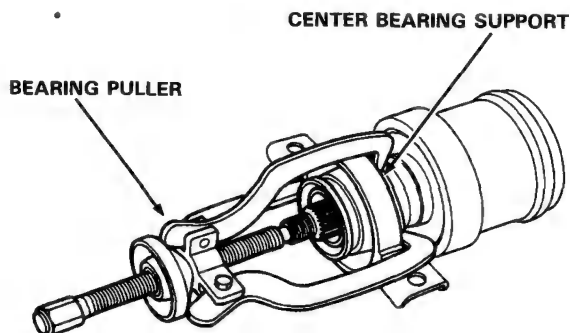


Propeller Shafts

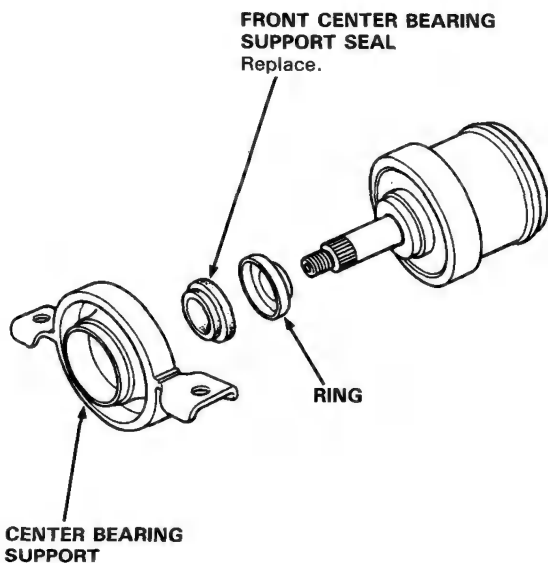
No. 1 Propeller Shaft Reassembly

NOTE:

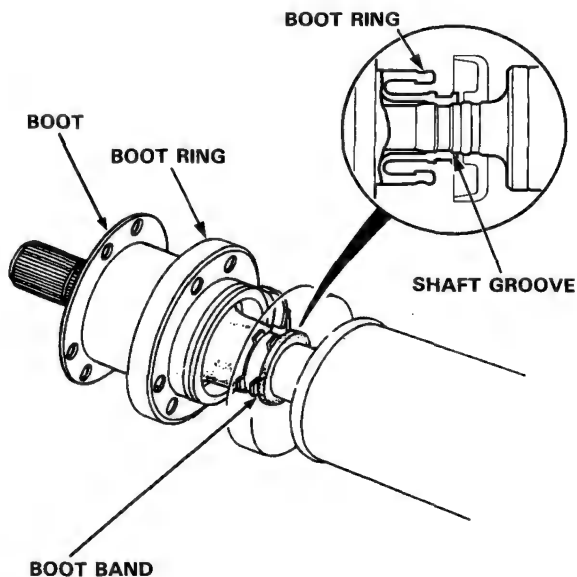
If difficulty is encountered in removing the shaft, use a puller. Replace the bearing support with a new one when a puller is used to remove it.



6. Remove the front center bearing support seal from the bearing support.
7. Remove the ring from the viscous coupling (No. 2 propeller shaft).



1. Slide the boot band, boot ring and boot onto the No. 1 propeller shaft.
2. Position the boot on the shaft so the raised area of the boot is aligned with the shaft groove.

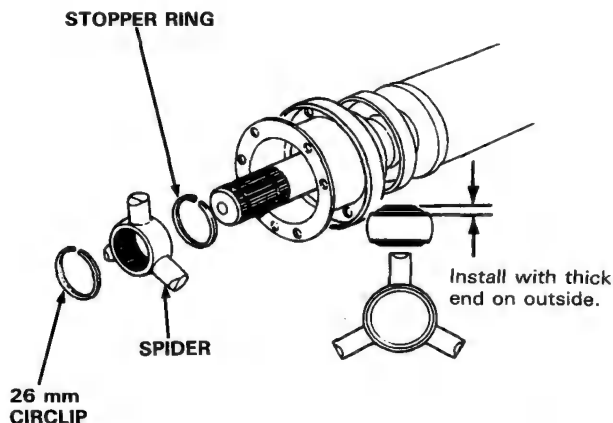


3. Seat the stopper ring in the shaft groove.
4. Install the spider on the propeller shaft making sure the marks made during disassembly are aligned.

NOTE:

Do not interchange the rollers between the roller shafts on the spider.

5. Install the 26 mm circlip in the shaft groove.



(cont'd)

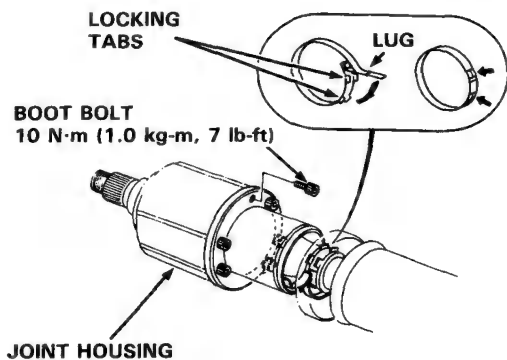
Propeller Shafts

No. 1 Propeller Shaft Reassembly (cont'd)

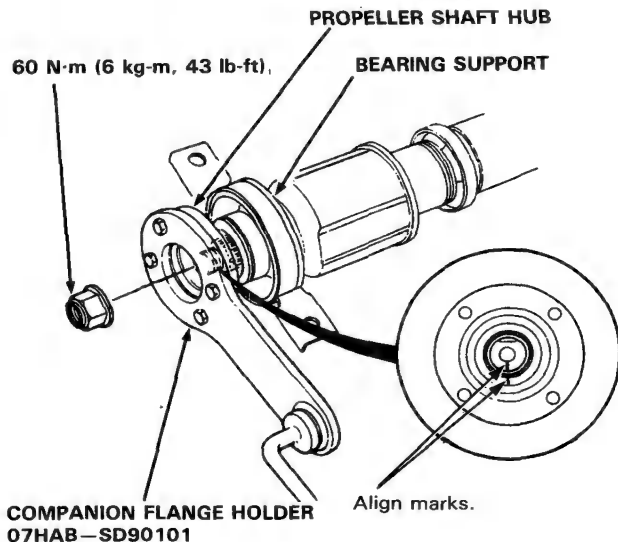
6. Pack the rollers and joint housing with molybdenum disulfide grease.

Amount: 60–70 g (2.1–2.5 oz)

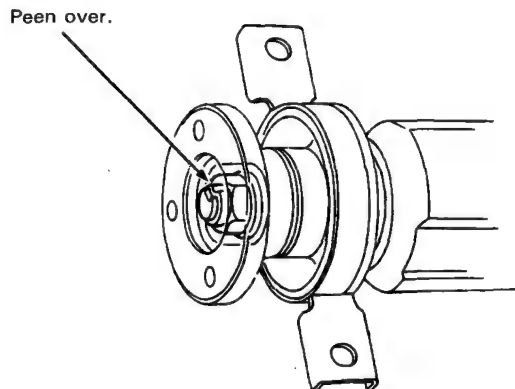
7. Slide the spider and rollers into the joint housing making sure that the marks are aligned.
8. Attach the boot ring to the joint housing with the boot bolts.
9. Install the new boot band and bend the lug of the boot band toward the locking tabs.
10. Secure the lug with the locking tabs on the boot.



11. Install the front and rear bearing support seal, bearing support.
12. Position the hub on the propeller shaft with the marks aligned, and install with the hub nut.



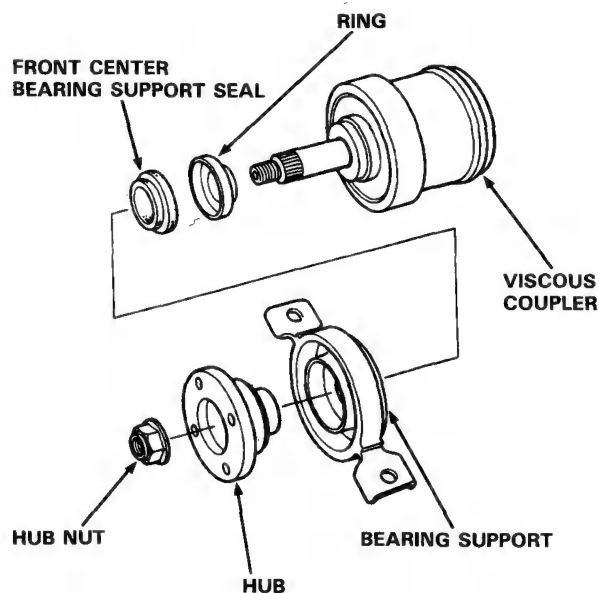
13. Peen the nut over the shaft end to lock in place.



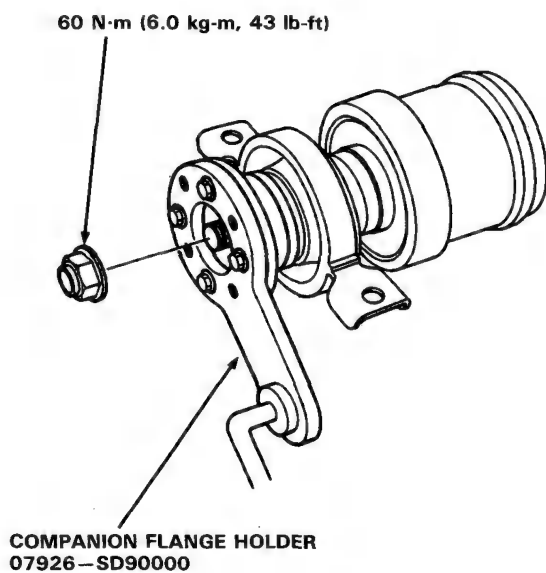


Viscous Coupler (No. 2 Propeller Shaft), No. 3 Propeller Shaft Reassembly

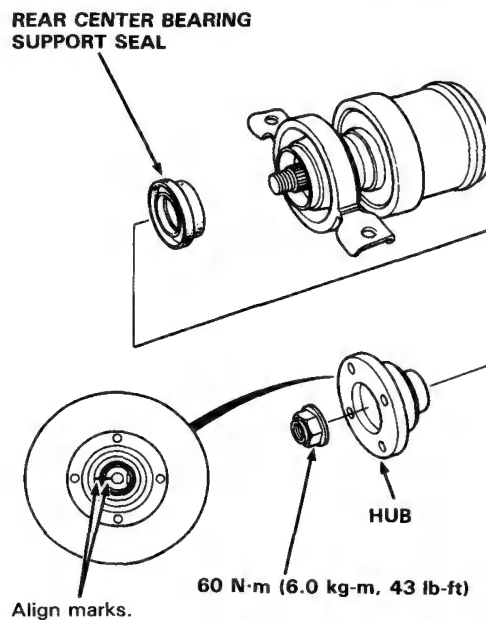
1. Temporarily install the ring, front center bearing support seal, bearing support, hub and hub nut on the viscous coupler.



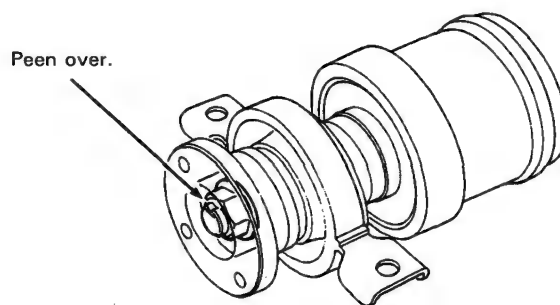
2. Hold the hub with the special tool, and torque the hub nut to force the bearing support into position.



3. Remove the hub nut and hub.
4. Install the rear center bearing support seal on the bearing support.
5. Position the hub on the propeller shaft with the marks aligned, and install with the hub nut.



6. Peen the nut over the shaft end to lock in place.

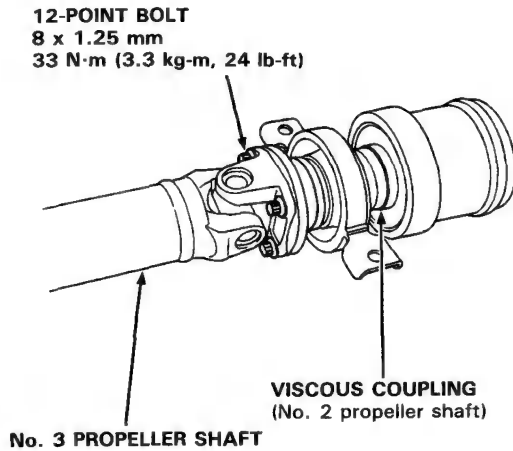


(cont'd)

Propeller Shafts

Viscous Coupler (No.2 Propeller Shaft), No. 3 Propeller Shaft Reassembly (cont'd)

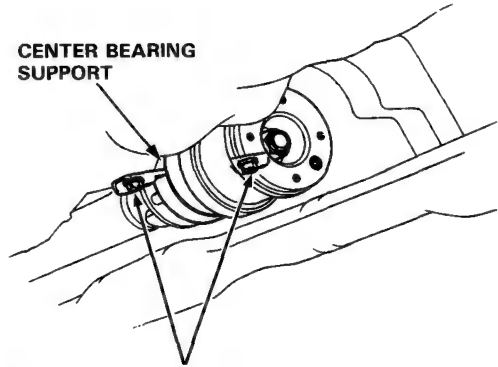
7. Temporarily connect the viscous coupler (No. 2 propeller shaft) and No. 3 propeller shaft with the 12-point bolts and yoke nuts.
8. Torque the all bolts and nuts.



Installation

- Viscous Coupling (No. 2 Propeller Shaft) and No. 3 Propeller Shaft.

1. Install the rear center bearing support on the frame.

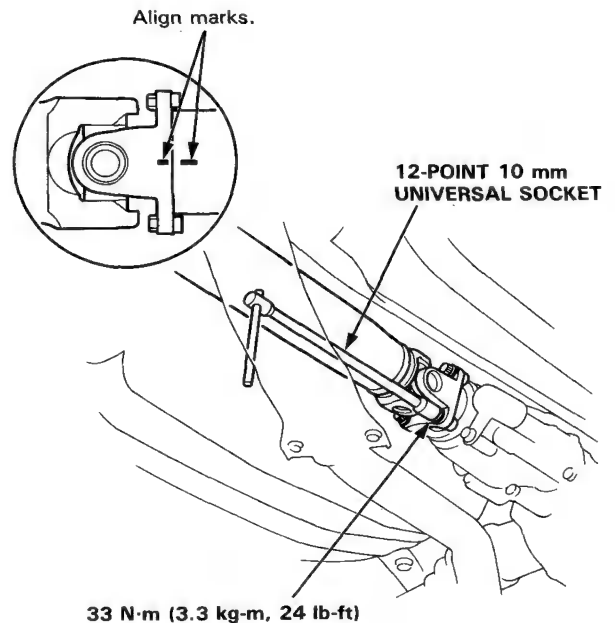


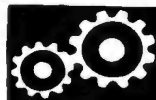
40 N·m (4.0 kg-m, 29 lb-ft)

2. Temporarily connect the propeller shaft and rear differential using the 12-point bolts and yoke nuts.
3. Torque all bolts and nuts.

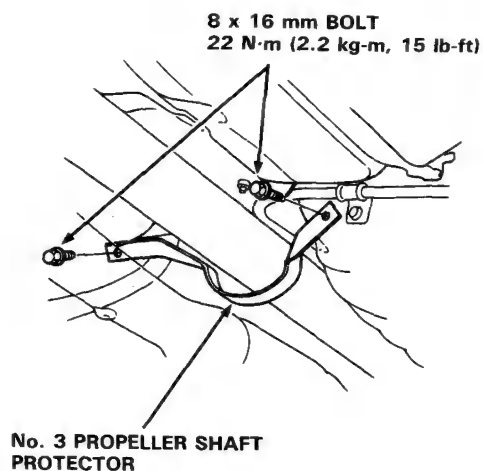
NOTE:

Use 12 Point Box Wrench for other portions.





4. Install the No. 3 propeller shaft protector.

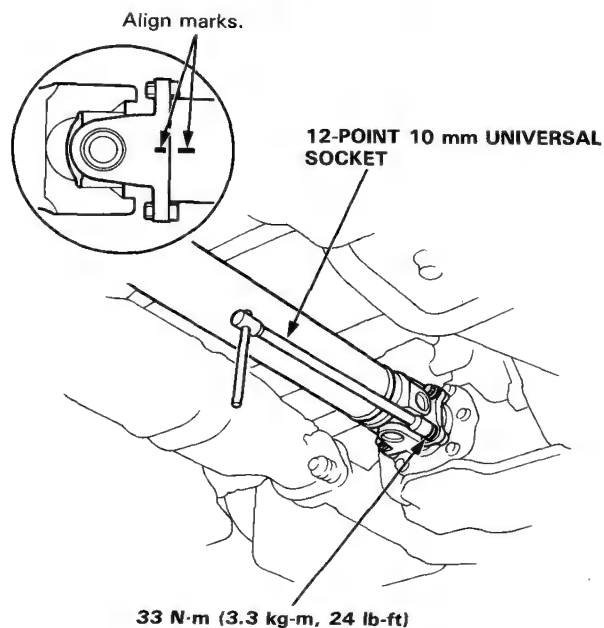


● No. 1 Propeller Shaft

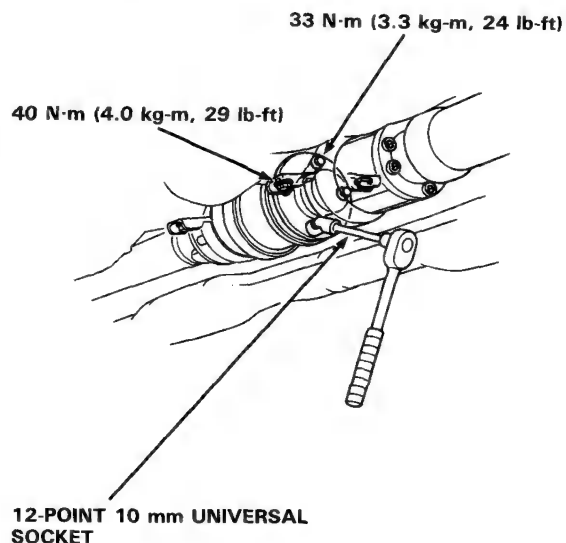
5. Temporarily connect the propeller shaft and front differential using the 12-point bolts and yoke nuts.
6. Torque all bolts and nuts.

NOTE:

Use 12 Point Box Wrench for other portions.



7. Install the front center bearing support on the frame. Temporarily connect the No. 1 propeller shaft and viscous coupling (No. 2 propeller shaft) using 12-point bolts.

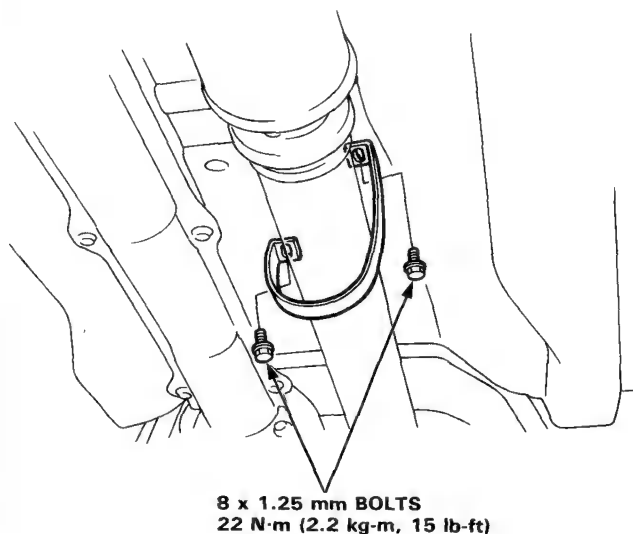


NOTE:

Use 12 Point Box Wrench for other portions.

8. Torque all bolts.
9. Install the No. 1 propeller shaft protector.

No. 1 PROPELLER SHAFT PROTECTOR



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if steering wheel and column servicing are required)

Some models of the CIVIC include a driver's side airbag, located in the steering wheel hub, as part of a Supplemental Restraint System (SRS). Information necessary to safely service the SRS is included in this service manual. Items marked * on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special cautions and tools, and should therefore be done only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, can lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

Steering

Manual Steering	17-1
Power Steering	17-29



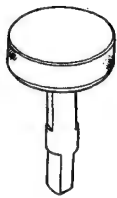
Manual Steering

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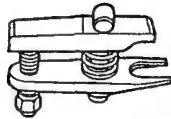


Special Tools

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07NAZ-SR30100	Lockwasher Pilot Clinch	1	17-12
②	07MAC-SL00200	Ball Joint Remover, 28 mm	1	17-6
③	07746-0020100	Inner Handle B	1	17-11
④	07916-SA50001	Locknut Wrench, 40 mm	1	17-4, 12
⑤	07974-SA50600	Pinion Dust Seal Guide	1	17-11
⑥	07974-SA50800	Ball Joint Boot Clip Guide	1	17-17



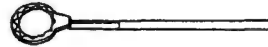
①



②



③



④



⑤



⑥

Component Location



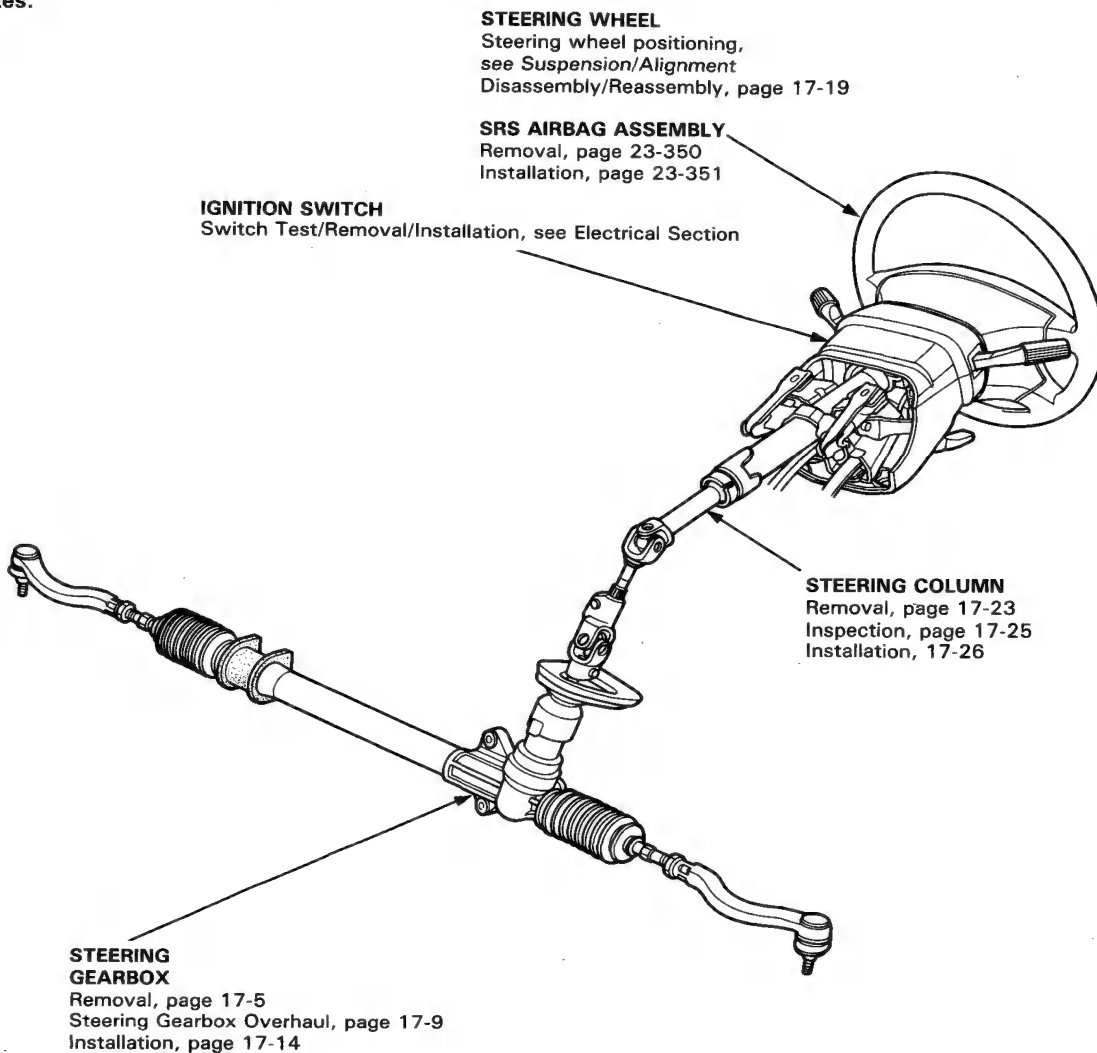
Index

NOTE:

- LH drive shown. RH drive is similar.
- If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).
- Before removing the gearbox, remove the ignition key to keep the steering shaft from turning.
- After installing the gearbox, check the wheel alignment and adjust if necessary.
- The tilt steering column is shown; the conventional steering column is similar except for the tilt mechanism.

CAUTION (with SRS):

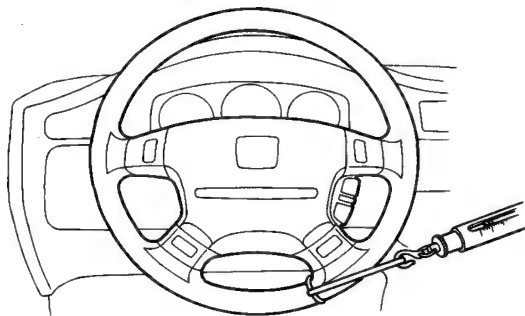
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



On-Car Checks

Steering Effort Check

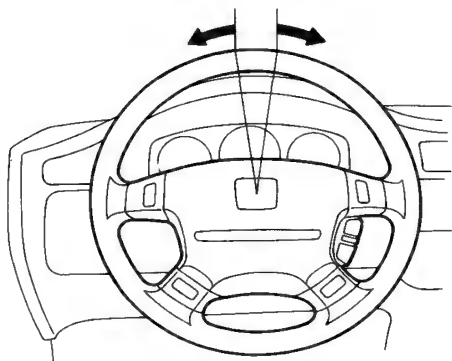
1. Raise the front wheels off the ground.
2. Turn the steering wheel with a spring gauge and check its reading.
3. If the reading exceeds the service limit, adjust the steering gearbox as shown below.
Service Limit: 15 N (1.5 kg, 3.3 lbs)



Steering Wheel Rotational Play

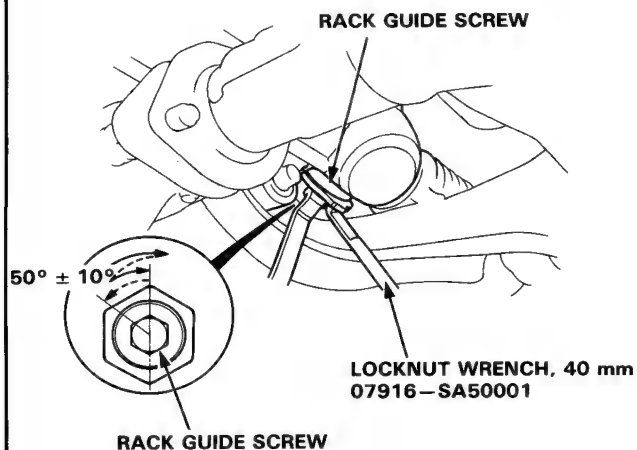
1. Place the front wheels in a straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.
2. If the play exceeds the service limit, check all steering components.
Service Limit: 10 mm (0.4 in)

0 – 10 mm (0 – 0.4 in)



Rack Guide Adjustment

1. Loosen the rack guide screw locknut with the special tool.
2. Retighten the rack guide screw until it compresses the spring and seats against the rack guide.



3. Back off the rack guide screw and install the locknut on the rack guide screw.
Back the rack guide screw off about: 50° ± 10°
4. Check for tight or loose steering through the complete turning travel.
5. Recheck steering effort.



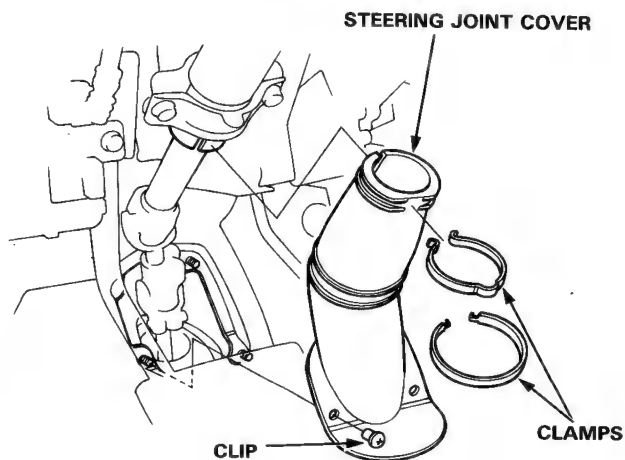
Steering Gearbox

Gearbox Removal

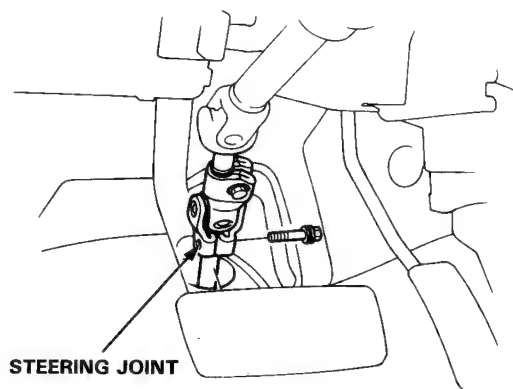
NOTE:

- Before removing the steering gearbox, align the front wheels straight ahead.
- Disconnect the battery negative terminal and then disconnect the positive terminal.

1. Raise the front of car and support on safety stands in the proper locations.
2. Remove the front wheels.
3. Remove the steering joint cover.

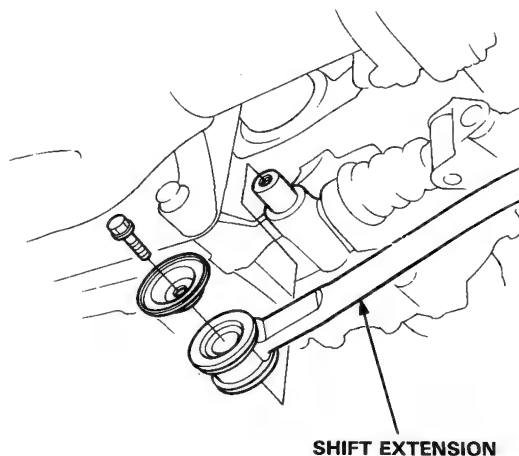


4. Remove the steering joint lower bolt, and move the joint toward the column.

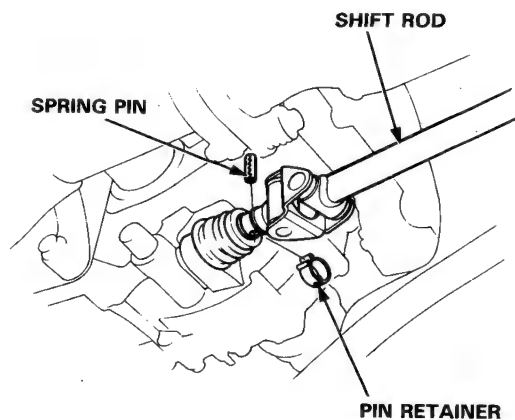


5. Manual transmission model only:

- Remove the shift extension from the transmission case.



- Slide the boot at the connecting position of the gear shift rod.
- Drive out the spring pin with a punch, then disconnect the shift rod.

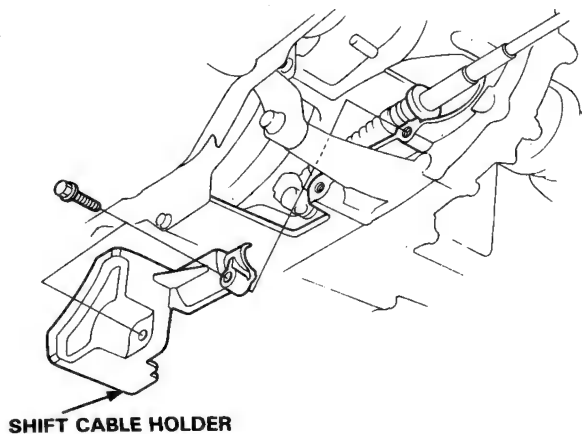


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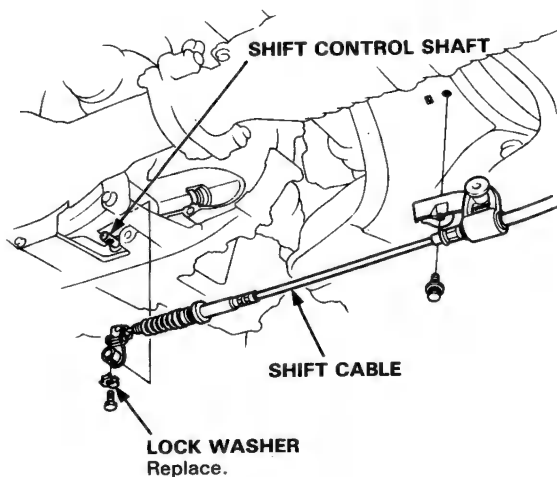
Steering Gearbox

Gearbox Removal (cont'd)

6. Automatic transmission only:
- Remove the shift cable holder

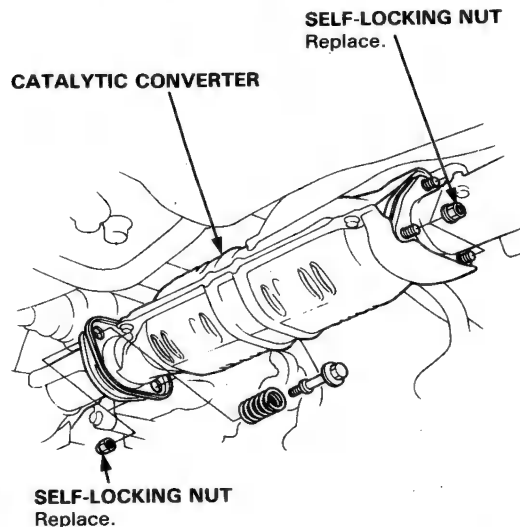


- Disconnect the shift cable from the shift control shaft.



7. Separate the catalytic converter by removing the self-locking nuts.

CAUTION: Replace the exhaust gasket and self-locking nuts when you reinstall the pipe.

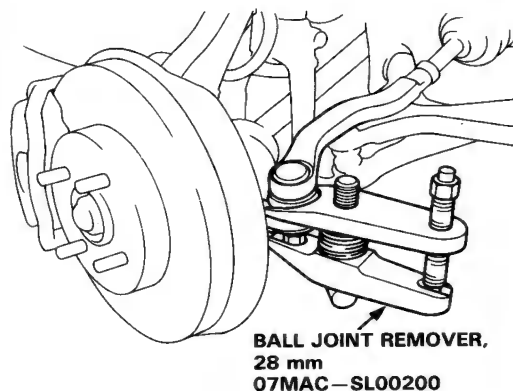


8. Remove the cotter pin from the tie-rod ball joint nut and remove the nut.
9. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Remove the ball joint using the Ball Joint Remover, 28 mm (07MAC-SL00200). Refer to page 18-12 for how to use the ball joint remover.

10. Separate the tie-rod ball joint and knuckle using the special tool.

CAUTION: Avoid damaging the ball joint boot.

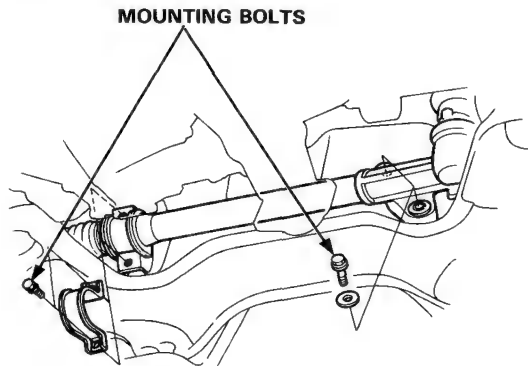




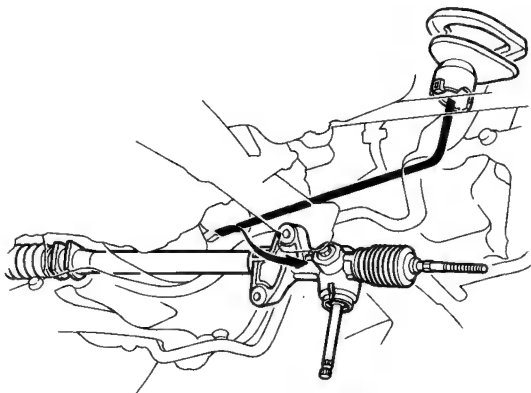
11. Remove the left tie-rod end, then slide the rack all the way to the right.

NOTE: Remove the performance rod, if it is equipped.

12. Remove the steering gearbox assembly mounting bolts and pinion shaft gromet.



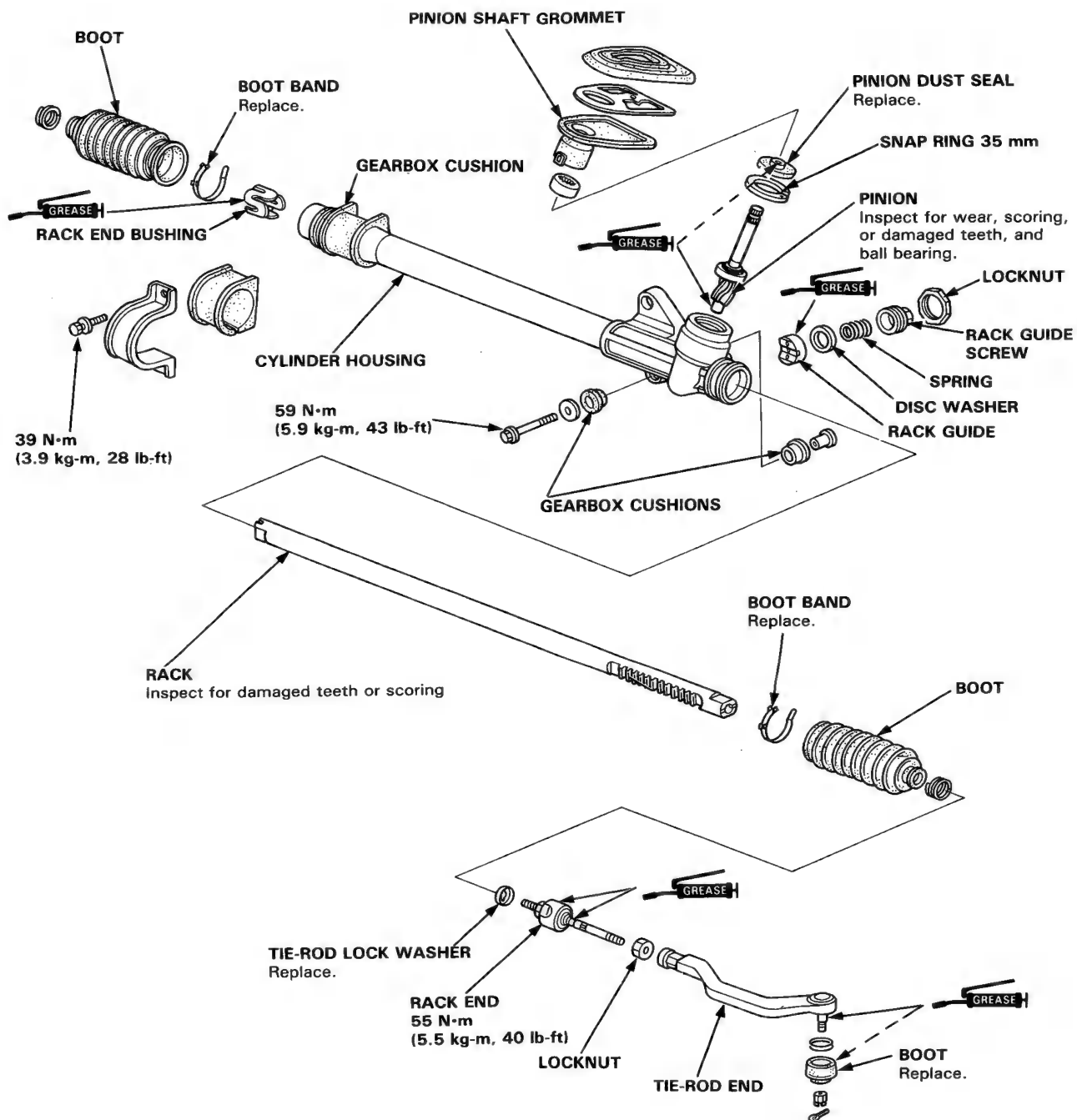
13. Pull the steering gearbox assembly all the way down to clear the pinion shaft from the bulkhead.
14. Move the steering gearbox assembly to the right so the left rack end clears the rear beam.
15. Hold the steering gearbox assembly and slide the rack all the way to the left, place the left rack end below the rear beam.
16. Move the steering gearbox assembly to the left and tilt the left side down to remove it from the car.



Steering Gearbox

Illustrated Index and Inspection

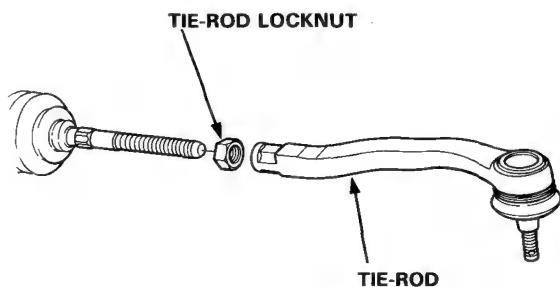
NOTE: LH drive shown. RH drive is similar.



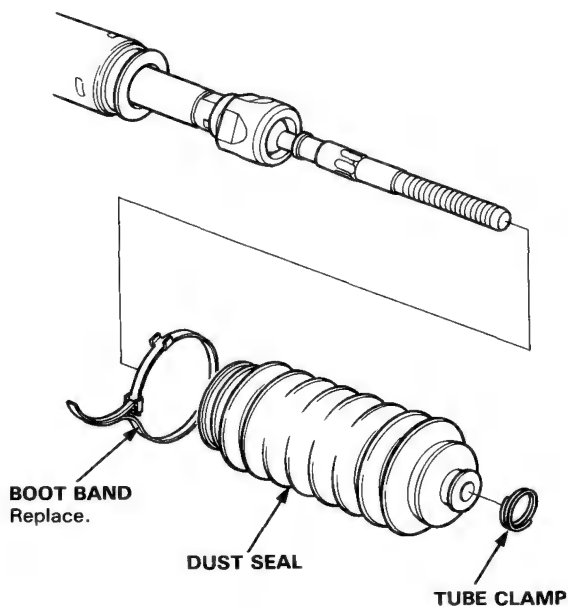


Overhaul

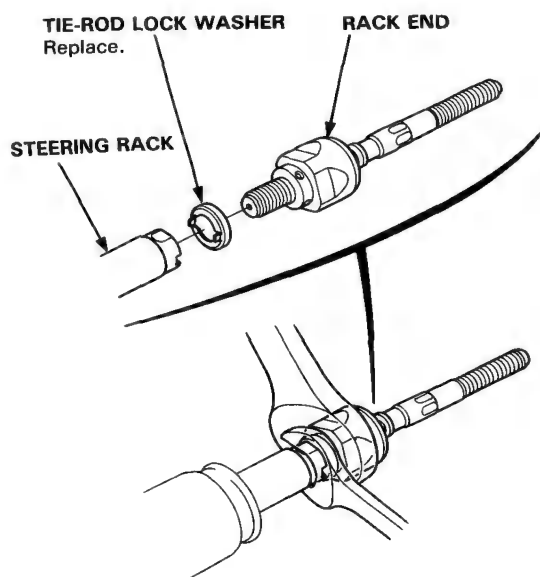
1. Carefully clamp the gearbox in a vise with soft jaws.
2. Remove the tie-rod assembly.



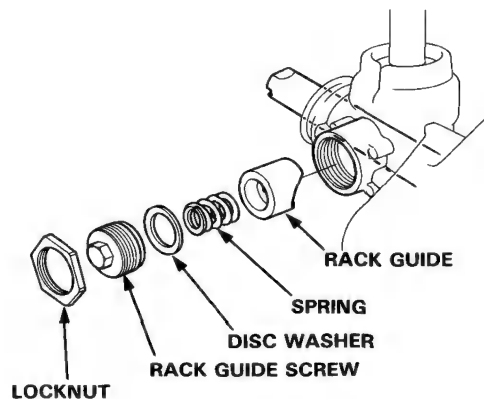
3. Remove the boot bands and tube clamps. Pull the dust seals away from the ends of the gearbox.



4. Hold the steering rack with a 19 mm wrench and unscrew the rack end with a wrench.



5. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.
6. Loosen the rack screw locknut and remove the rack guide screw.
7. Remove the disc washer, spring and rack guide from the gear housing.



(cont'd)

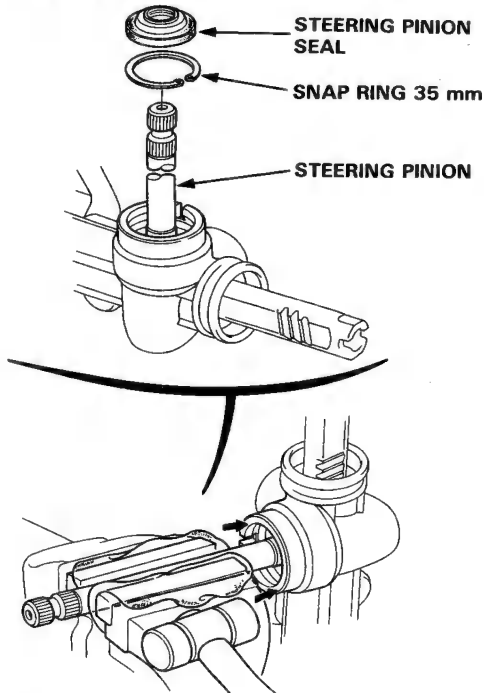
Steering Gearbox

Overhaul (cont'd)

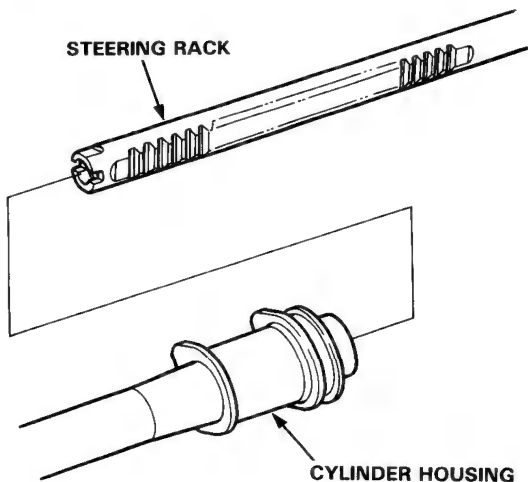
8. Remove the pinion dust seal, and 35 mm snap ring, then pull the pinion assembly out of the gearbox.

NOTE: Hold the pinion shaft with a vise securely. Remove the pinion assembly by tapping around the flanged section of the gearbox with a plastic hammer evenly. Do not reuse the removed pinion assembly.

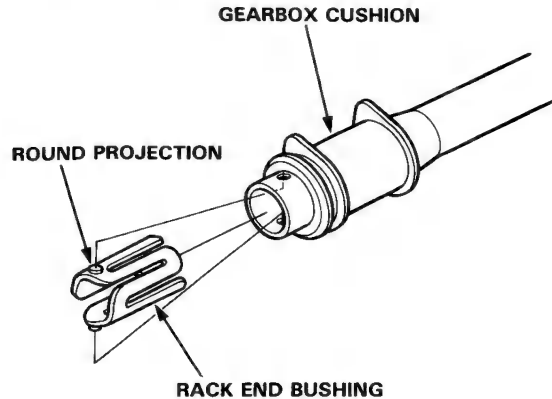
CAUTION: Do not tap on the steering rack.



9. Slide the steering rack out of the cylinder housing.

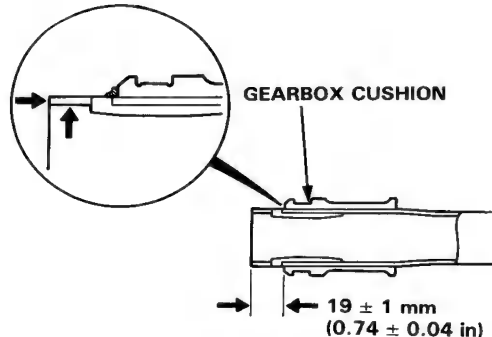


10. Remove the rack end bushing.



11. Replace the gearbox cushion if necessary.

- To remove the cushion, use a sharp knife and make a cut down the length of the cushion. Be careful not to damage the paint on the cylinder housing. Remove the old cushion.
- Apply weatherstrip adhesive to the inside of the new cushion. Install the cushion onto the cylinder housing and position it 19 ± 1 mm (0.74 ± 0.04 in) from the end of the cylinder housing as shown.



NOTE: After installing the cushion, wipe off any excess adhesive that may have dripped into the inside of the cylinder housing.



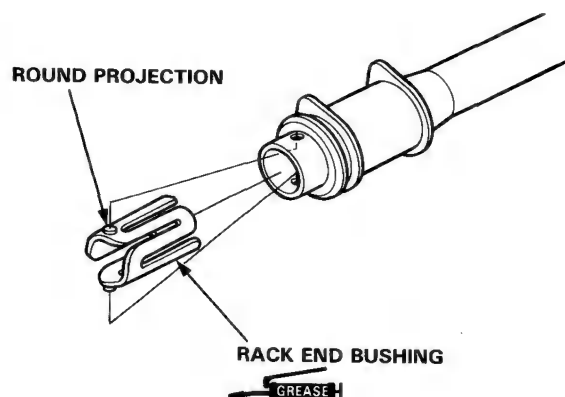
12. Apply a thin coat of grease to the inside surface of the rack end bushing.

Grease quantity: 1–3 g (0.1 oz)

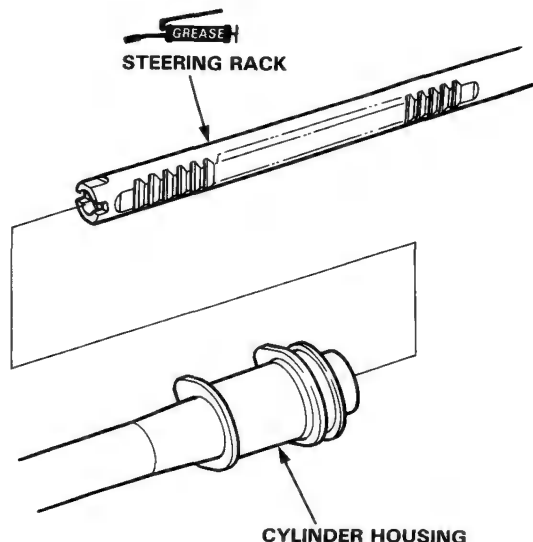
CAUTION:

Do not fill the slots with grease; they must remain open to serve as air passages.

13. Install the rack end bushing by aligning the round projection on the bushing with the hole in the cylinder housing.



14. Apply grease to the steering rack.
15. Install the steering rack into the cylinder housing carefully to avoid damaging the steering rack sliding surface.

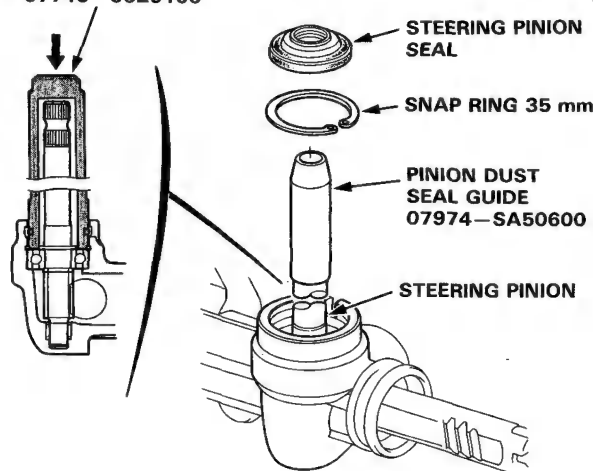


16. Install the steering pinion in the gear housing with the special tools.

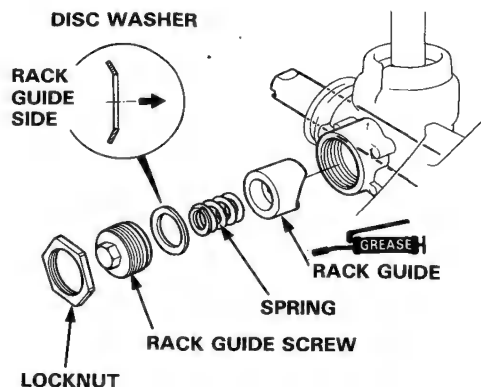
17. Install the 35 mm snap ring securely in the gear housing groove.

18. Apply grease the surface of the special tool, and install it on the pinion shaft. Then grease the sealing lip of the steering pinion seal, and install it into the gear housing. Remove the special tool.

**INNER HANDLE B
07746–0020100**



19. Coat the rack guide with grease.
20. Install the rack guide, spring, disc washer and rack guide screw on the gear housing.

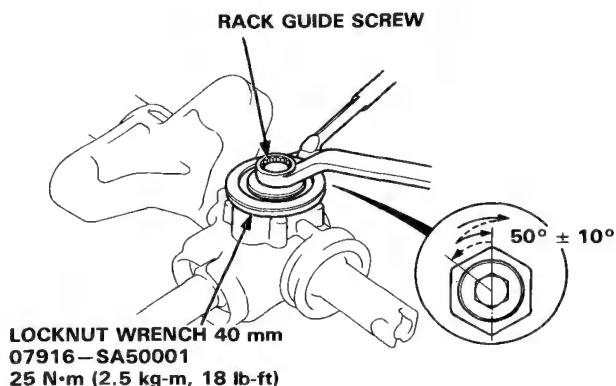


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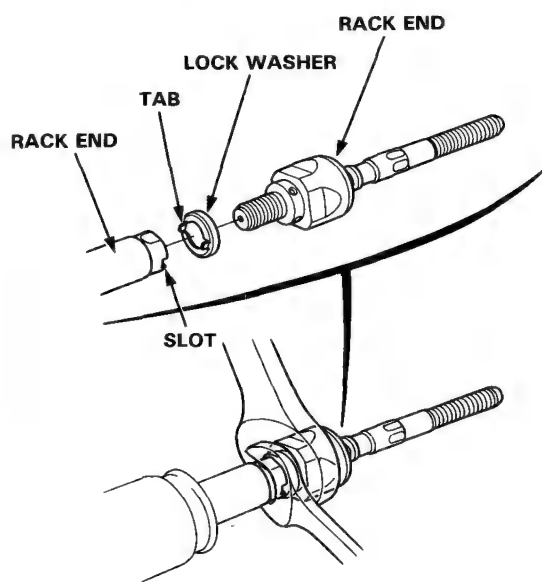
Steering Gearbox

Overhaul (cont'd)

21. Tighten the rack guide screw until it compresses the spring and seats against the rack guide.
22. Back off the rack guide screw and install the locknut on the rack guide screw.
Back the rack guide screw off about: $50^{\circ} \pm 10^{\circ}$
23. Tighten the locknut while holding the rack guide screw with the special tool.



24. Install the new lock washer in the groove in the steering rack.
25. Hold the steering rack with a wrench and tighten the rack end to 55 N·m (5.5 kg-m, 40 lb-ft).

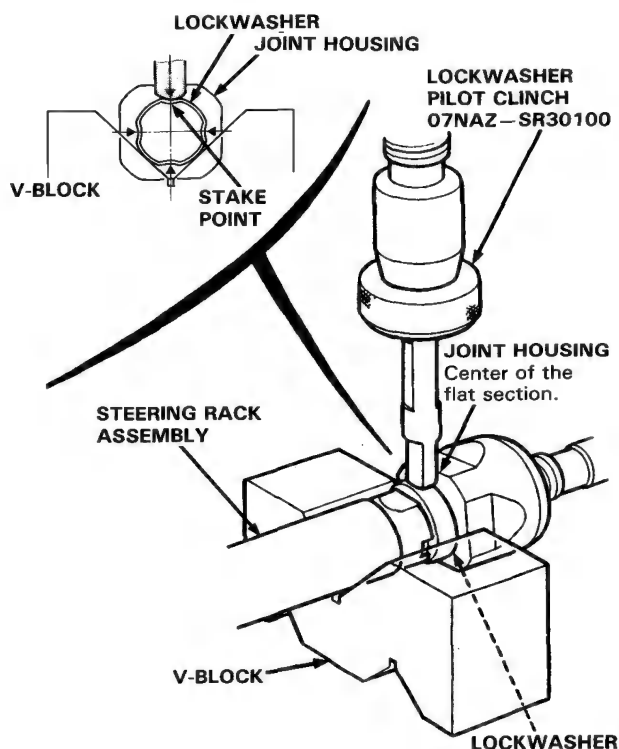


26. After tightening the rack end stake the four section of lockwasher with the special tool and hydraulic press.

NOTE: Set the V-block on the press table. Set the lock washer section of the rack end on the V-block securely.

- Be sure that the pressing direction, special tool, and each lockwasher stake position are in line.
- Stake the lockwasher in the center of the flat section of the joint housing. (The bottom end of the stake must be in that position.) See below.

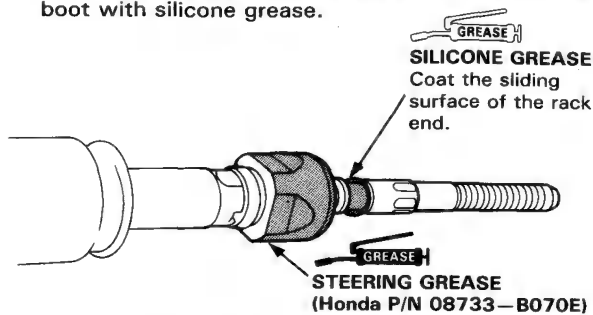
STAKE POINT "▼".





27. Apply steering grease to the circumference of the rack end housing.

NOTE: Coat the rack end groove and inside of the boot with silicone grease.



28. Install the boots on the rack end with the tube clamps.

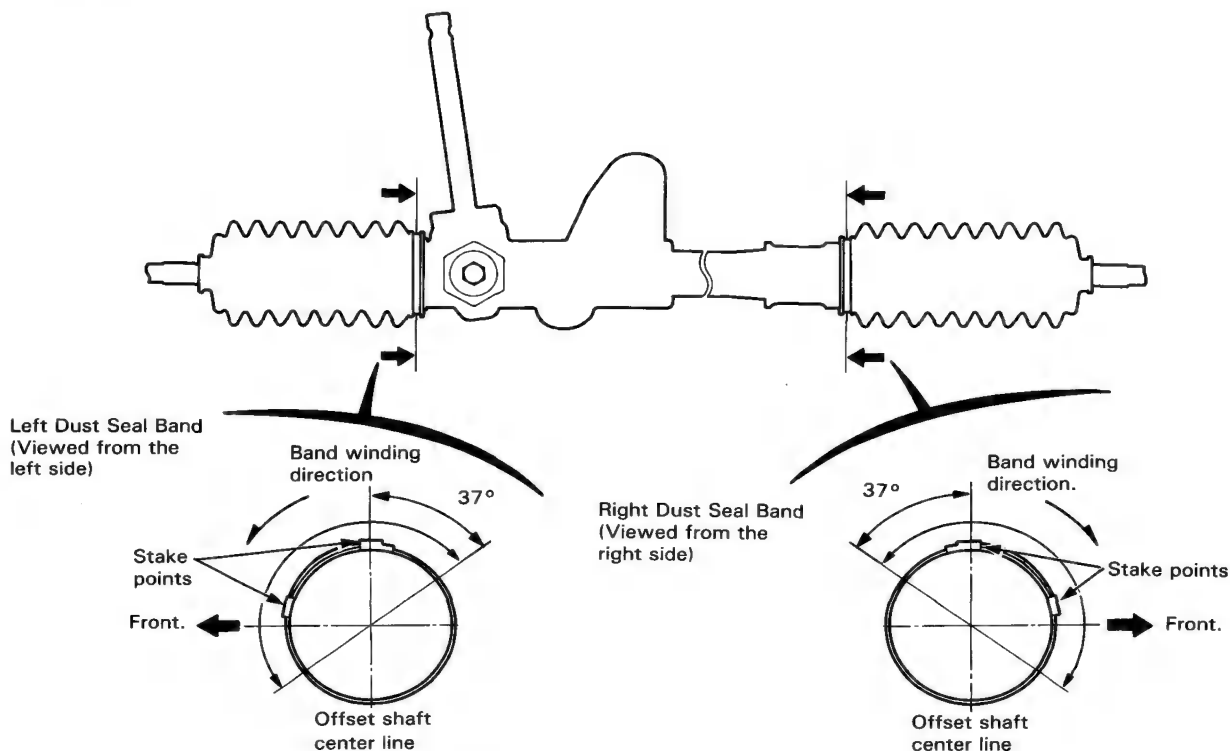
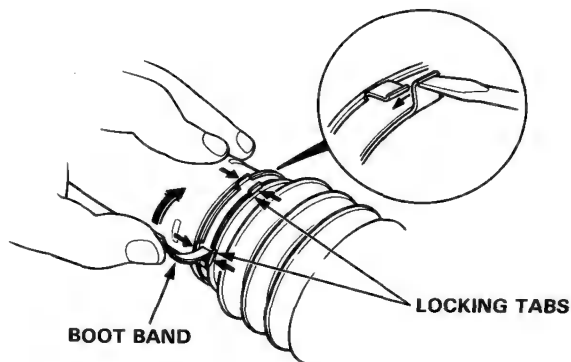
NOTE: Install the boot band with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).

29. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)

CAUTION: Stake the band locking tabs firmly.

30. Install new boot bands on the boot and bend both sets of locking tabs.

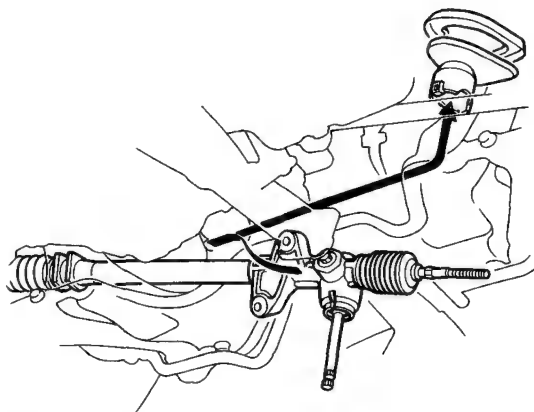
31. Lightly tap on the doubled-over portions to reduce their height.



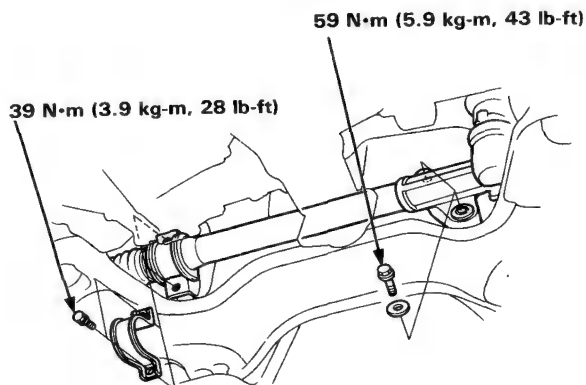
Steering Gearbox

Gearbox Installation

1. Slide the rack all the way to the right.
2. Pass the right side of the steering gearbox assembly above and through the right side.
3. Hold the steering gearbox assembly and slide the rack all the way to the right.
4. Raise the left side of the steering gearbox assembly above and through the left side of the rear beam.
5. Install the pinion shaft grommet and insert the pinion shaft up through the bulkhead.



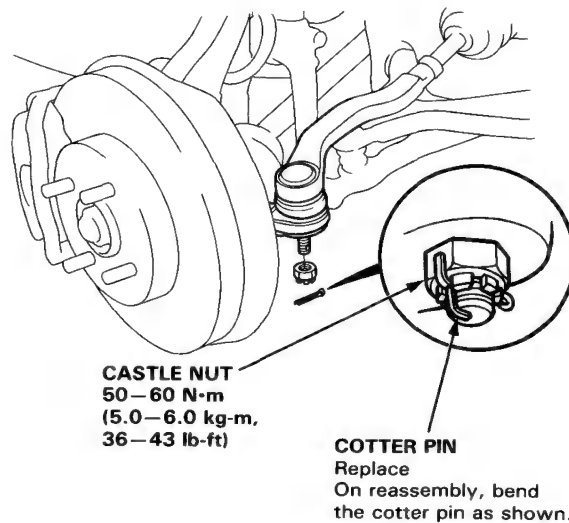
6. Install and tighten the gearbox mounting bolts.



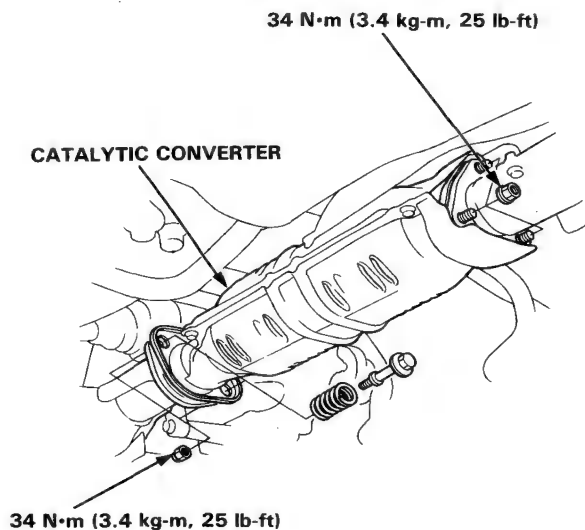
NOTE: Install the performance rod, if it is equipped.

7. Reconnect the tie-rods to the steering knuckles, tighten the ball joint nut to the specified torque, and install new cotter pins.

CAUTION: Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



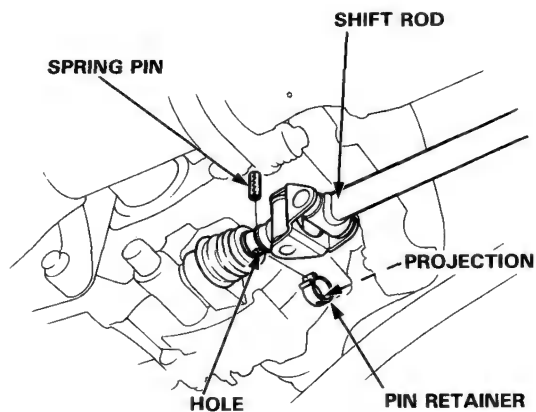
8. Install the catalytic converter with the new gaskets and self-locking nuts.



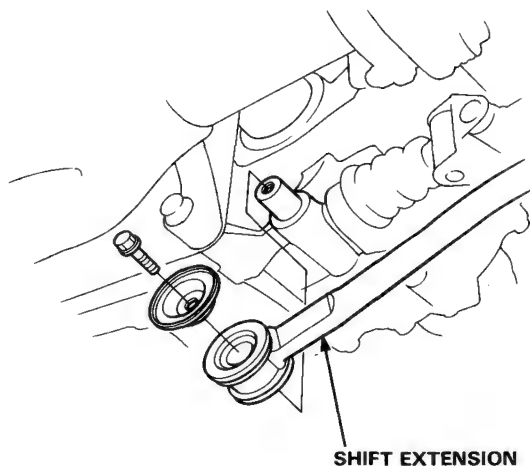


9. Manual transmission model only:

- Connect the shift rod to the transmission and drive the spring pin with a punch, then install the pin retainer. Be sure that the projection on the pin retainer is in the hole.

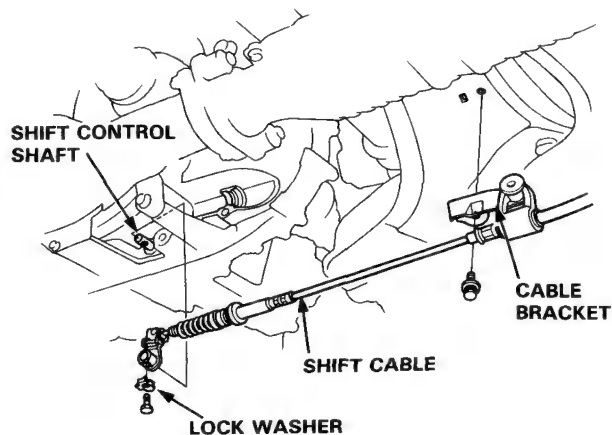


- Install the shift extension on the transmission case.

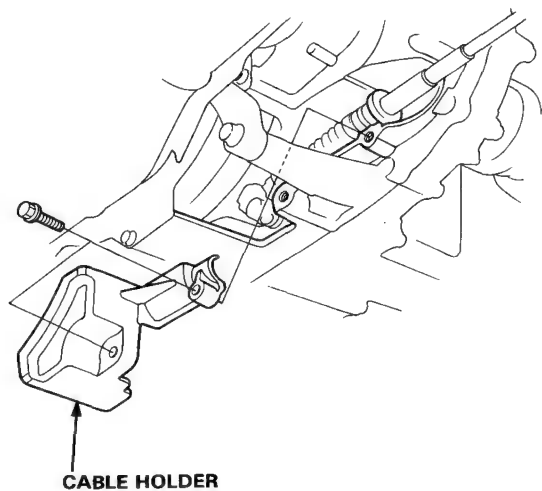


10. Automatic transmission model only:

- Connect the shift cable end to the shift control shaft, and bend the lock washer securely.
- Install the cable bracket.



- Install the cable holder.



(cont'd)

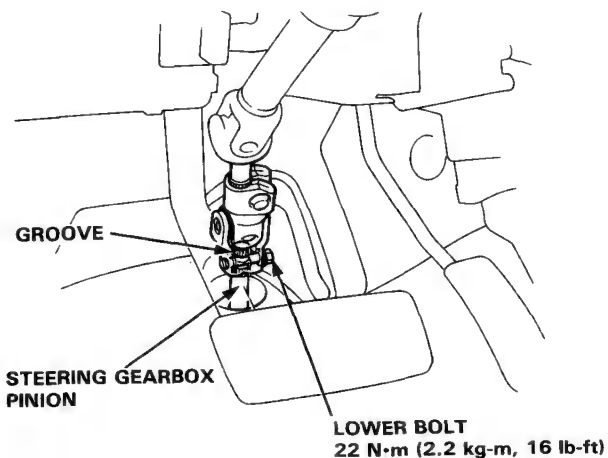
Steering Gearbox

Gearbox Installation (cont'd)

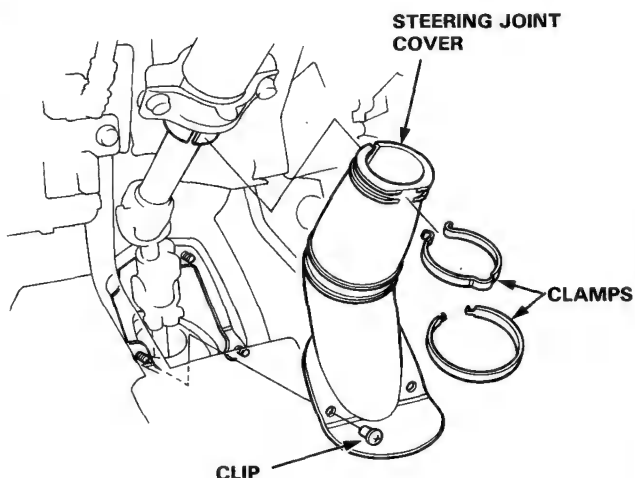
11. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and loosely install the lower bolt.

CAUTION: Before tightening the steering joint bolts pull the steering joint to make sure that the steering joint is fully seated.

12. Tighten the steering joint bolts to the specified torque.

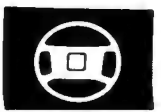


13. Install the steering joint cover with the clamps and clip.



14. After installation, perform the following checks.
- Check the front toe.
 - Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

NOTE: Turn the right and left tie-rods equally.



Ball Joint Boot Replacement

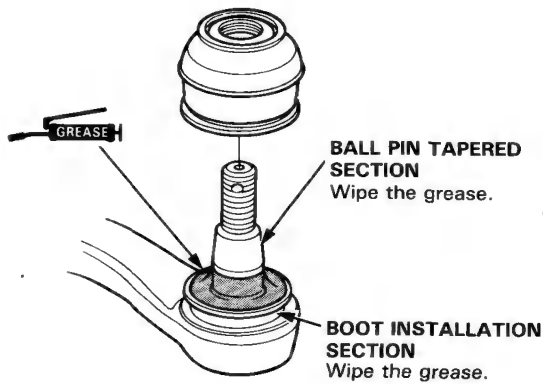
1. Remove the circlip and the boot.

CAUTION: Do not contaminate the boot installation section with grease.

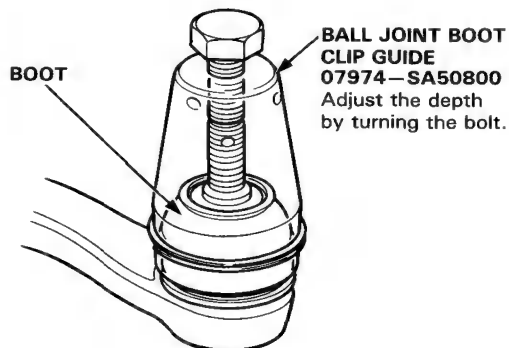
2. Pack the interior of the boot and lip with grease.
3. Wipe the grease off the sliding surface of the ball pin, then pack the lower area with fresh grease.

CAUTION:

- Keep grease off the boot installation section and the tapered section of the ball pin.
- Do not allow dust, dirt, or other foreign materials to enter the boot.



4. Install the boot in the groove of the boot installation section securely, then bleed air.



CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

Steering Wheel (With SRS)

Removal

Airbag Assembly Removal

▲ WARNING Store a removed airbag assembly with the pad surface up, if the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

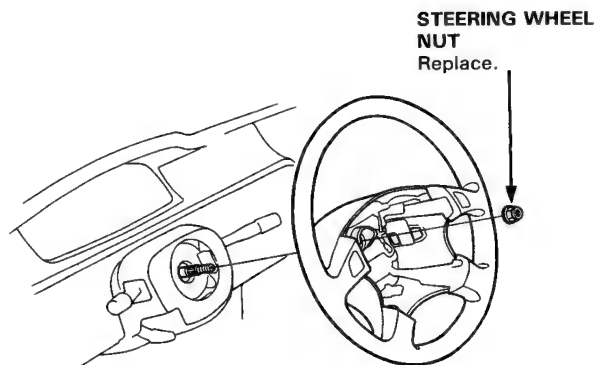
CAUTION:

- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Carefully inspect the airbag assembly before installing it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Do not disassemble or tamper with the airbag assembly.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.

NOTE:

- Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX bolt first (the safety switch will automatically turn off).
1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
 2. Remove the airbag assembly (page 23-350).

3. Remove the steering wheel nut.
4. Remove the steering wheel by locking it slightly from side-to-side as you pull steadily with both hands.





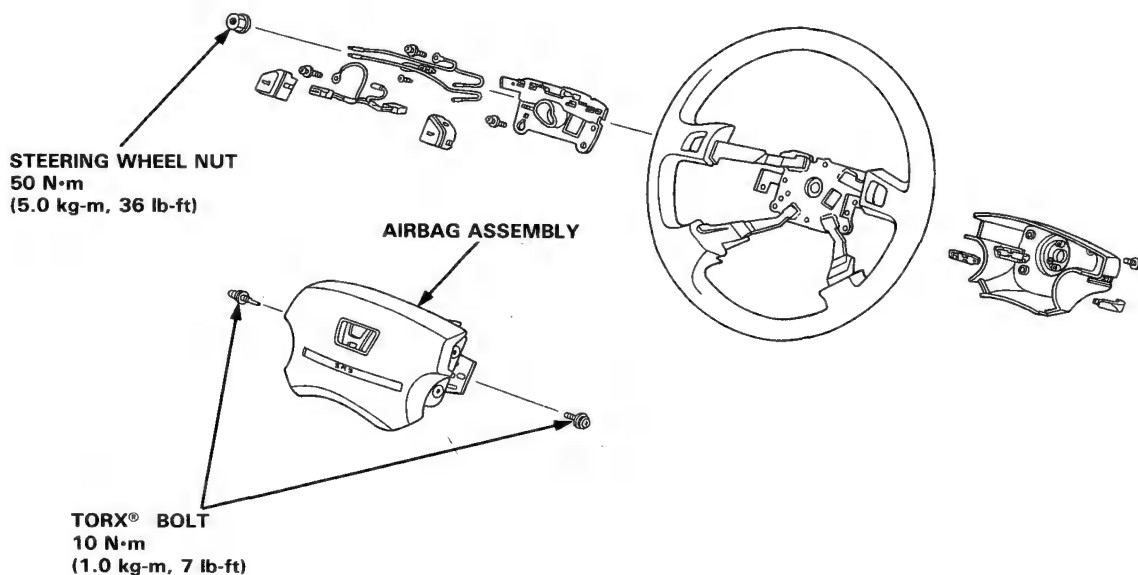
Disassembly/Reassembly

⚠ WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

NOTE: If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see page, 23-352).

CAUTION:

- Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Do not disassemble or tamper with the airbag assembly.

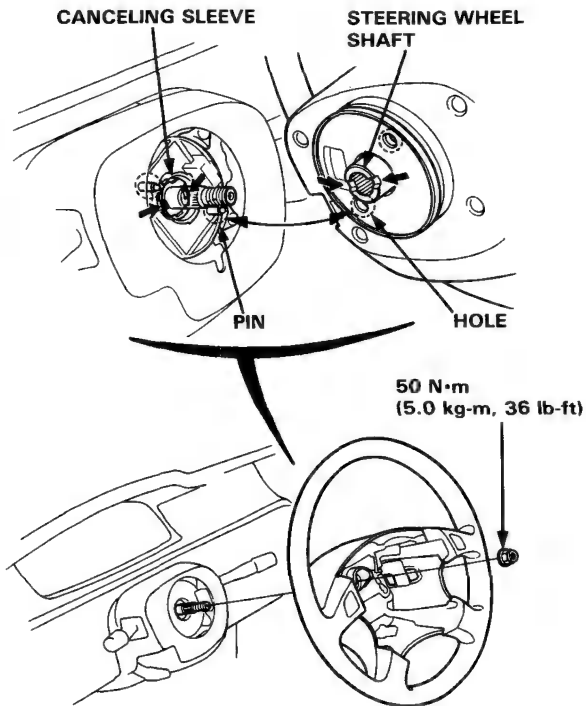


Steering Wheel (With SRS)

Installation

1. Install the steering wheel on the column.

NOTE: Be sure the steering wheel shaft engages the slip ring and canceling sleeve.



2. Install the airbag assembly (See page 23-351).

CAUTION:

- Be sure to install the SRS wiring so that it is not pinched or interfering with other car parts.
- Be sure the battery cables are disconnected.

3. After installing the airbag assembly, confirm proper system operation:

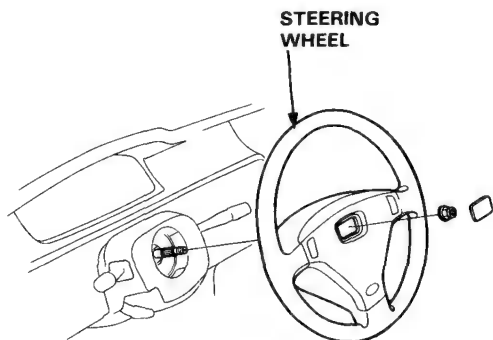
- Turn the ignition to ON: the instrument panel SRS indicator light should go on for about 6 seconds and then go off.
- The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.



Steering Wheel (Without SRS)

Removal

1. Remove the center pad.
2. Remove the steering wheel nut.
3. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.



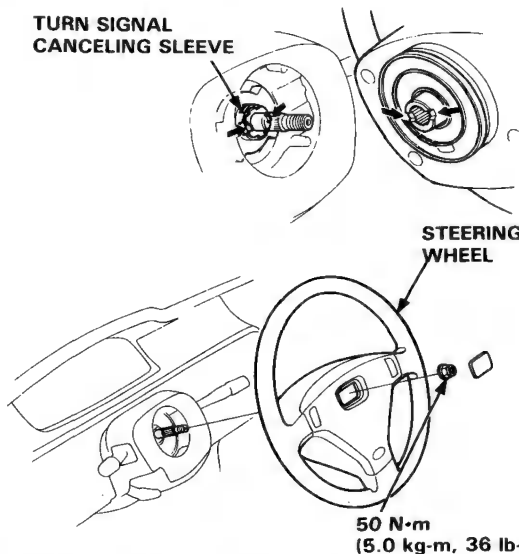
Installation

1. Install the steering wheel.

NOTE: Be sure the steering wheel shaft engages the turn signal canceling sleeve.

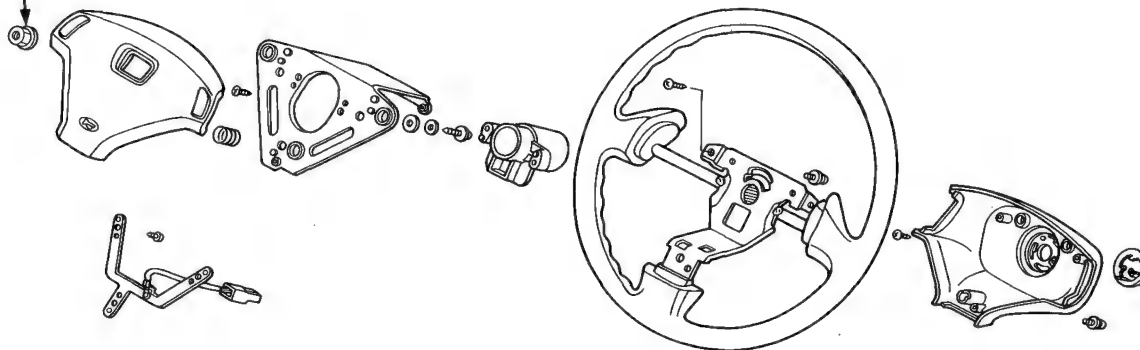
2. Install the center pad.

TURN SIGNAL
CANCELING SLEEVE



Disassembly/Reassembly

50 N·m (5.0 kg-m, 36 lb-ft)
Replace.





Steering Column

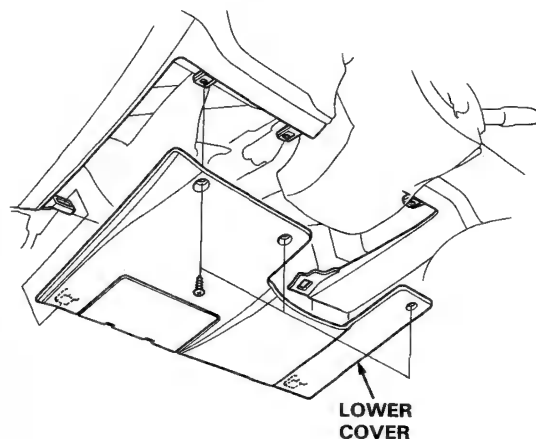
Removal

CAUTION (with SRS):

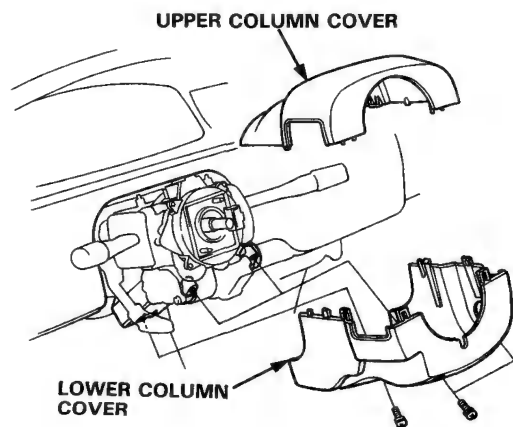
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LH drive shown. RH drive is similar.

1. Remove the steering wheel (17-18).
2. Remove the lower cover.



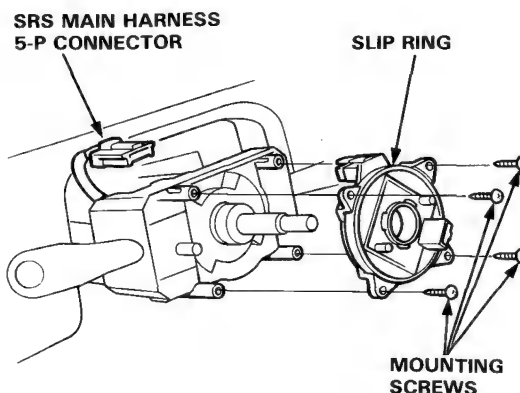
3. Remove the upper column and lower column covers.



4. Pull out the connector lock, then disconnect the SRS main harness 5-P connector from the slip ring.

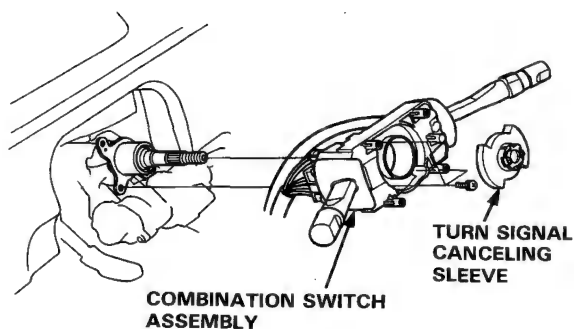
NOTE: Dispose of the connector lock, it is not to be reused.

5. Remove the slip ring from the combination switch assembly.



6. Remove the turn signal canceling sleeve and the combination switch assembly.

NOTE: After removing the combination switch assembly, place it on the floor gently so that it does not hinder you in service. Do not disconnect the harnesses from the combination switch assembly.

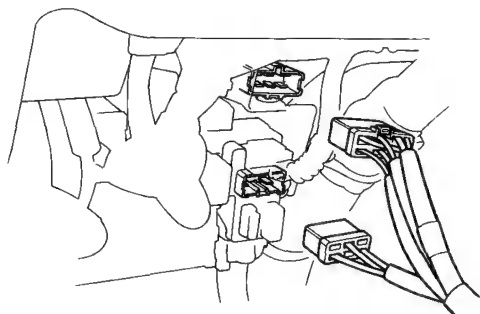


(cont'd)

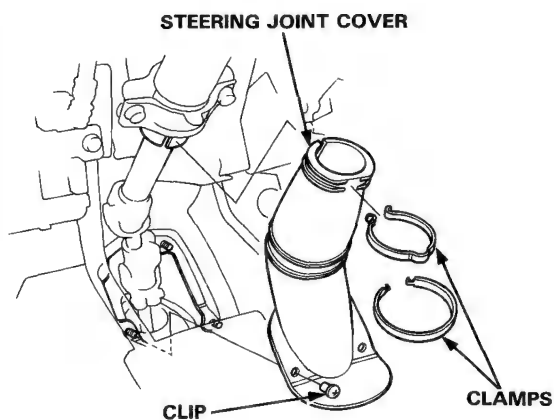
Steering Column

Removal (cont'd)

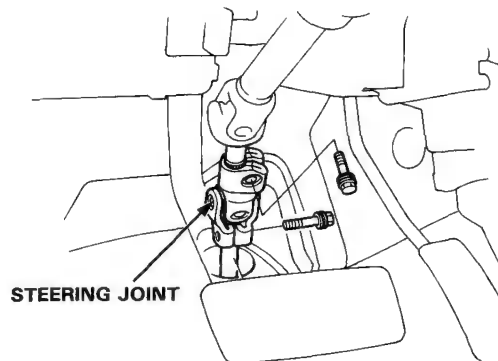
7. Disconnect the ignition switch connectors from the under-dash fuse box.



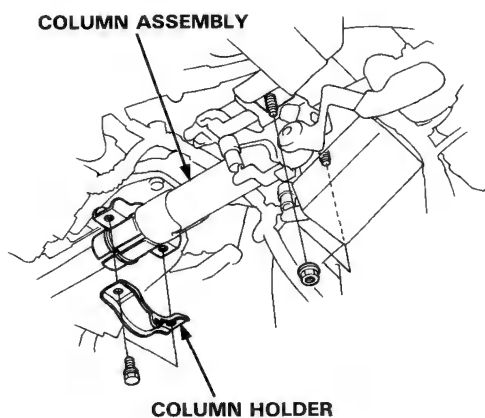
8. Remove the steering joint cover.



9. Remove the steering joint bolts, and move the joint toward the column.



10. Remove the steering column assembly by removing the attaching nuts and bolts.

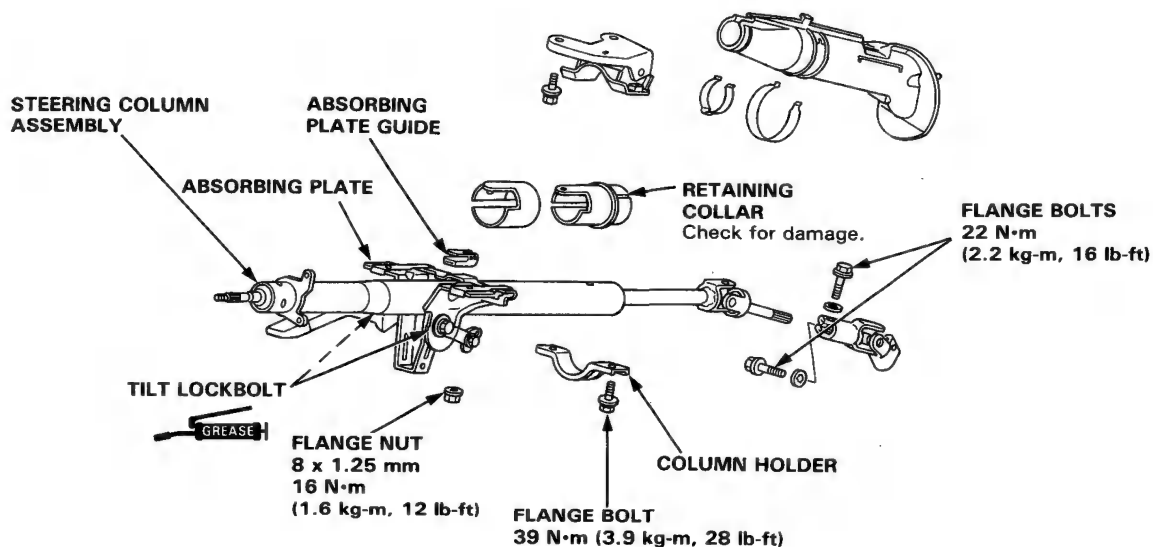




Inspection

NOTE:

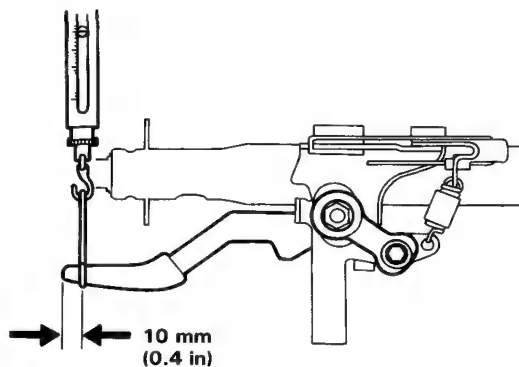
- Check the tilt mechanism, steering joint bearings and steering shaft for proper movement and damage. Replace as an assembly if damaged or faulty.
- The tilt steering column is shown; the conventional steering column is similar except for the tilt mechanism.



- Attach a spring scale to the knob of the tilt lever. Measure the force required to move the lever.

Preload: 70–90 N (7–9 kg, 15–20 lbs)

If the force measured is not within the specification, loosen the lock bolt, then the stopper, until the correct force can be obtained.



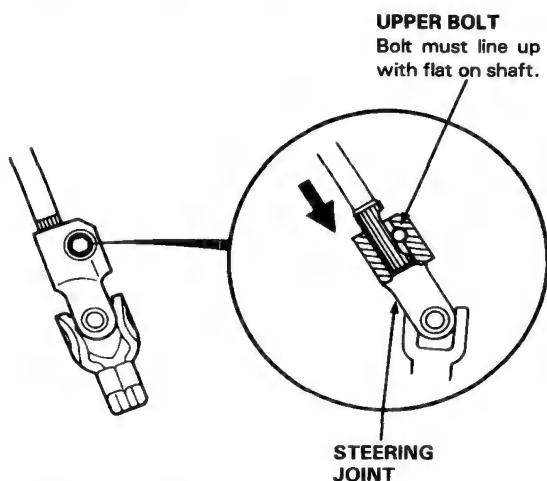
Steering Column

Installation

CAUTION:

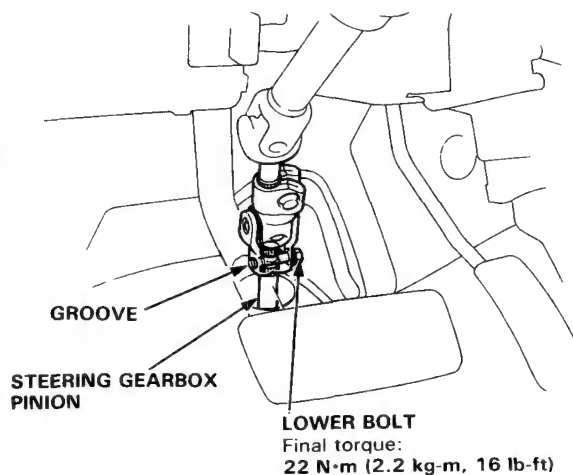
- After reassembly, confirm that the wheels are still straight ahead and that the steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary do so only by adjustment of the tie rods, not by removing and repositioning the steering wheel.

1. Slip the upper end of the steering joint onto the column shaft (line up the bolt hole with the flat on the shaft) and loosely install the upper bolt.

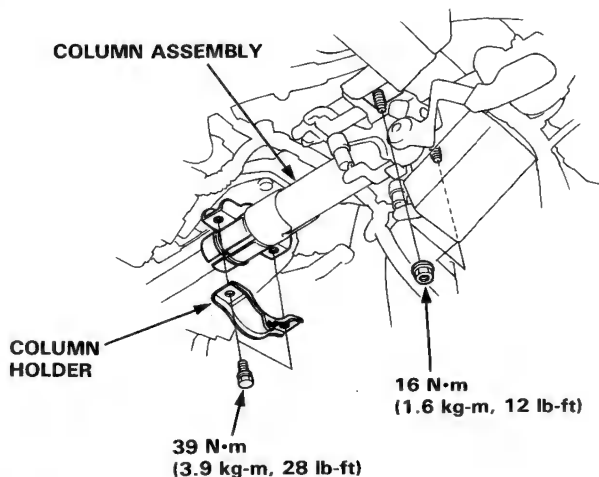


2. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and loosely install the lower bolt.

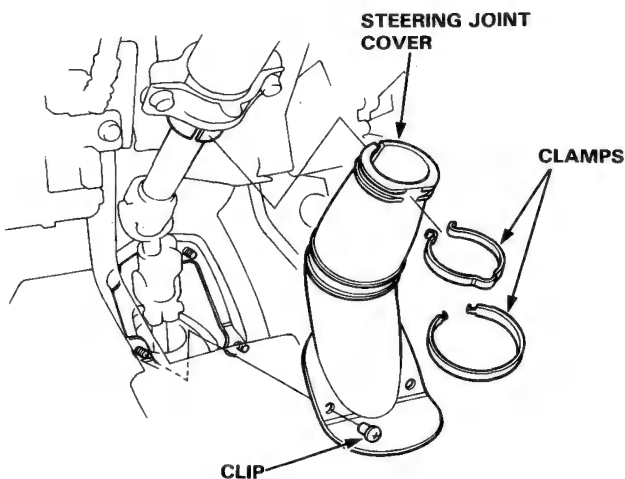
NOTE: Be sure that the lower bolt is securely in the groove in the steering gearbox pinion.



3. Install the steering column assembly with the nuts and column holder.
4. Tighten the upper and lower steering joint bolts loosely installed in step 2.



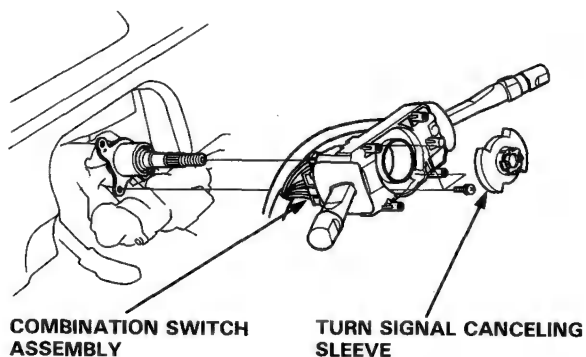
5. Install the steering joint cover with the clamps and clip.



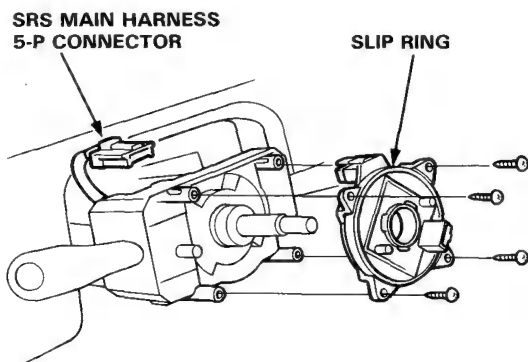


6. Connect the wire connectors from the ignition switch to the under-dash fuse box.
7. Install the combination switch assembly and turn signal canceling sleeve onto the steering column.

NOTE: Be sure the wires are not caught or pinched by any parts when installing the combination switch.

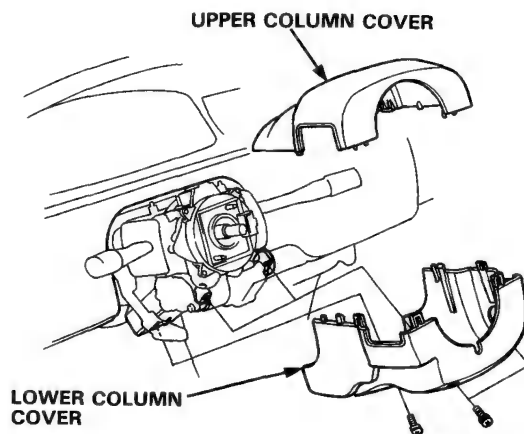


8. Install the slip ring on the steering column, then connect the SRS main harness 5-P connector to the slip ring.

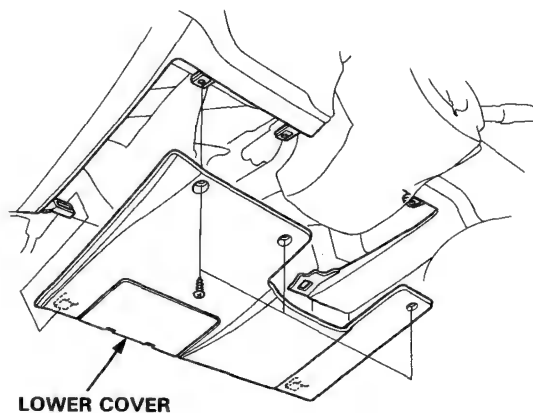


CABLE REEL WIRE

9. Install the upper column cover and lower column cover.



10. Install the lower cover.



11. Install the steering wheel and airbag assembly (page 17-20).

Power Steering

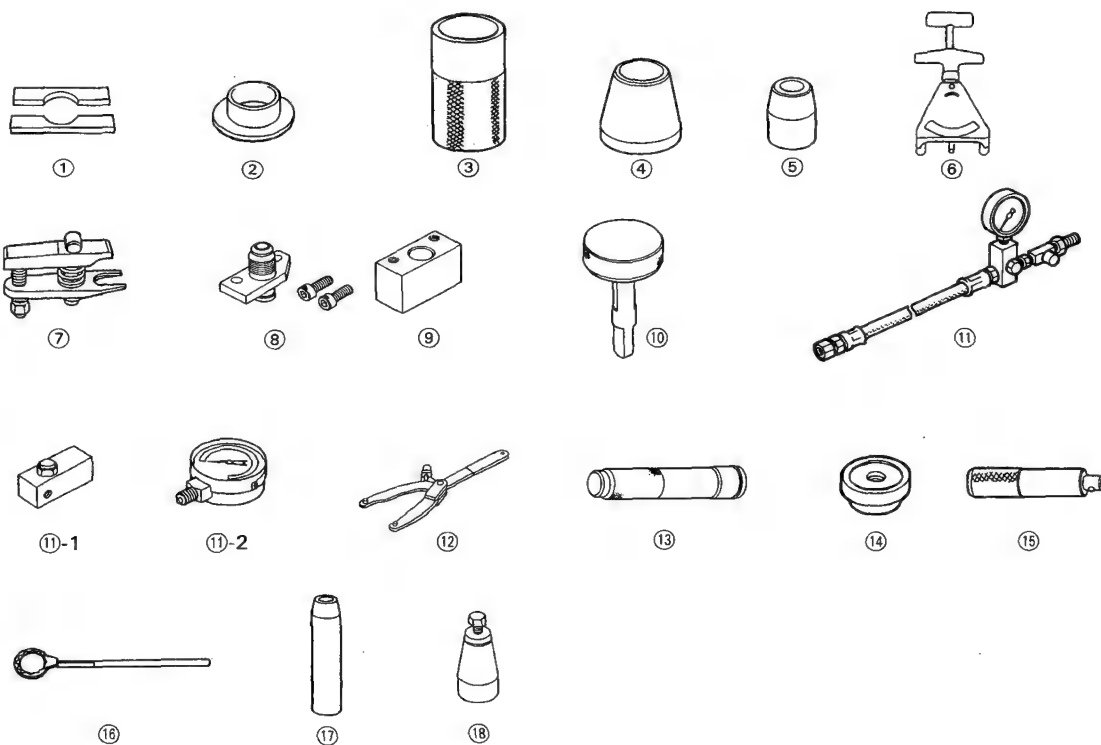
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Special Tools

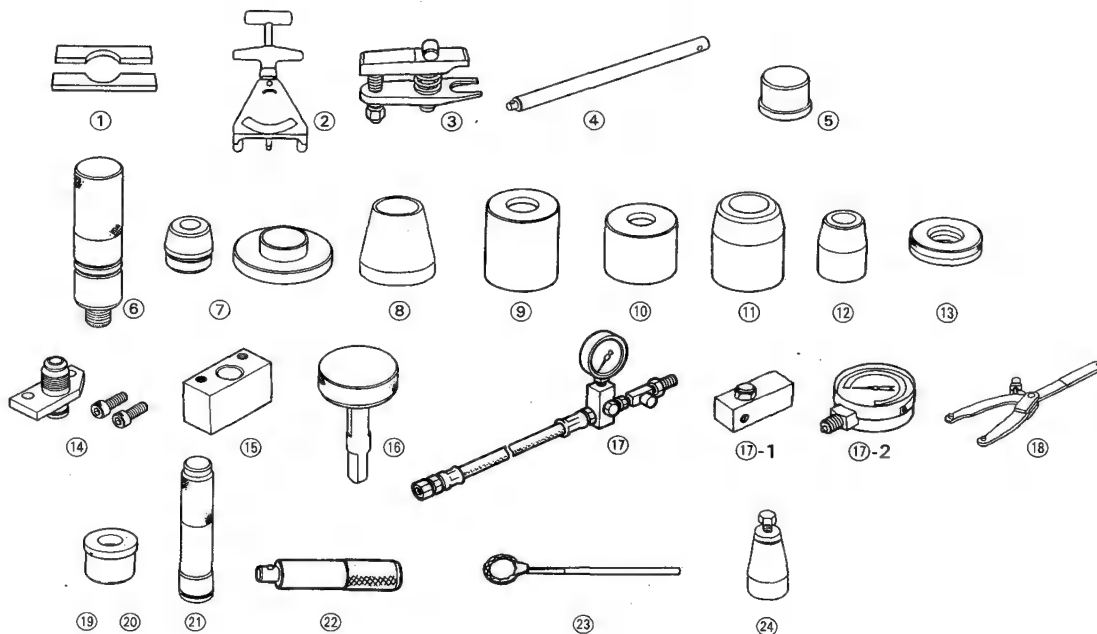
LHD

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	✓07GAF—SD40700	Hub Dis/Assembly Base	1	17-81, 94
②	✓07GAG—SD40100	Piston Seal Ring Guide	1	17-99
③	✓07GAG—SD40200	Piston Seal Ring Sizing Tool	1	17-99
④	07GAG—SD40300	Cylinder End Seal Slider	1	17-100
⑤	✓07GAG—SD40400	Cylinder End Seal Guide	1	17-102
⑥	✓07JGG—0010100	Belt Tension Gauge	1	17-60
⑦	✓07MAC—SL00200	Ball Joint Remover, 28 mm	1	17-90
⑧	✓07NAK—SR3011A	P/S Joint Adapter (Pump)	1	17-63
⑨	✓07NAK—AR3012A	P/S Joint Adapter (Hose)	1	17-63
⑩	✓07NAZ—SR30100	Lockwasher Pilot Clinch	1	17-104
⑪	✓07406—0010001	P/S Pressure Gauge	1	17-63
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⑫	✓07725—0030000	Universal Holder	1	17-76
⑬	✓07746—0020100	Inner Handle B	1	17-82
⑭	✓07746—0010300	Attachment, 42 x 47 mm	1	17-94
⑮	✓07749—0010000	Driver	1	17-97
⑯	✓07916—SA50001	Locknut Wrench, 40 mm	1	17-61, 103
⑰	✓07974—SA50600	Pinion Dust Seal Guide	1	17-88
⑱	✓07974—SA50800	Ball Joint Boot Clip Guide	1	17-132





Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07GAF—SD40700	Hub/Dis Assembly Base	1	17-81, 117, 118
②	07JGG—0010100	Belt Tention Gauge	1	17-60
③	07MAC—SL00200	Ball Joint Remover, 28 mm	1	17-110
④	07NAD—SR30100	Handle Driver	1	17-116
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⑥	07NAG—SR30200	End Packing Setting Tool	1	17-122
⑦	07NAG—SR30300	End Packing Slider	1	17-121
⑧	07NAG—SR30400	Piston Seal Ring Guide	1	17-120
⑨	07NAG—SR30500	Piston Seal Sizing Tool	1	17-120
⑩	07NAG—SR30600	Sleeve Seal Sizing Tool	1	17-119
⑪	07NAG—SD50400	Sleeve Seal Guide	1	17-119
⑫	07NAG—SR30800	End Seal Guide	1	17-122
⑬	07NAG—SR30900	Valve Seal Sizing Tool	1	17-119
⑭	07NAK—SR3011A	P/S Joint Adapter (Pump)	1	17-63
⑮	07NAK—SR3012A	P/S Joint Adapter (Hose)	1	17-63
⑯	07NAZ—SR30100	Lockwasher Pilot Clinch	1	17-125
⑰	07406—0010001	P/S Pressure Gauge	1	17-63
⑰-1	07406—0010300	Pressure Control Valve	1	17-63
⑰-2	07406—0010400	Pressure Gauge	1	17-63
⑱	07225—0030000	Universal Holder	1	17-76
⑲	07746—0010100	Attachment, 32 x 35 mm	1	17-118
⑳	07746—0010700	Attachment, 24 x 26 mm	1	17-117
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㉒	07749—0010000	Driver	1	17-117, 118
㉓	07916—SA50001	Locknut Wrench, 40 mm	1	17-61, 124
㉔	07974—SA50800	Ball Joint Boot Guide	1	17-132



Component Location

Index (LHD)

NOTE:

- If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).
- Before removing the gearbox, remove the ignition key to keep the steering shaft from turning.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

STEERING WHEEL

Steering wheel positioning,
see Suspension/Alignment
Disassembly/Reassembly, page 17-66

SRS AIRBAG ASSEMBLY

Removal, page 23-350
Installation, page 23-351

STEERING COLUMN

Removal, page 17-70
Inspection, page 17-72
Installation, page 17-73

IGNITION SWITCH

Steering Lock Replacement and
Switch Test, see Electrical Section

POWER STEERING OIL PRESSURE SWITCH

Troubleshooting, see
section 11

VALVE BODY UNIT

Overhaul, page 17-84

STEERING GEARBOX

Rack Guide Adjustment, page 17-61
Removal, page 17-89
Index, page 17-92
Overhaul, page 17-93
Installation, page 17-106

RESERVOIR

Fluid Replacement,
page 17-62

PUMP

Pump Belt Adjustment, page 17-60
Fluid Replacement, page 17-62
Pump Pressure Check, page 17-63
Pump Replacement, page 17-76
Control Valve Inspection and
Replacement, page 17-77
Disassembly, page 17-79
Reassembly, page 17-82

BALL JOINT BOOT

Replacement, page 17-132



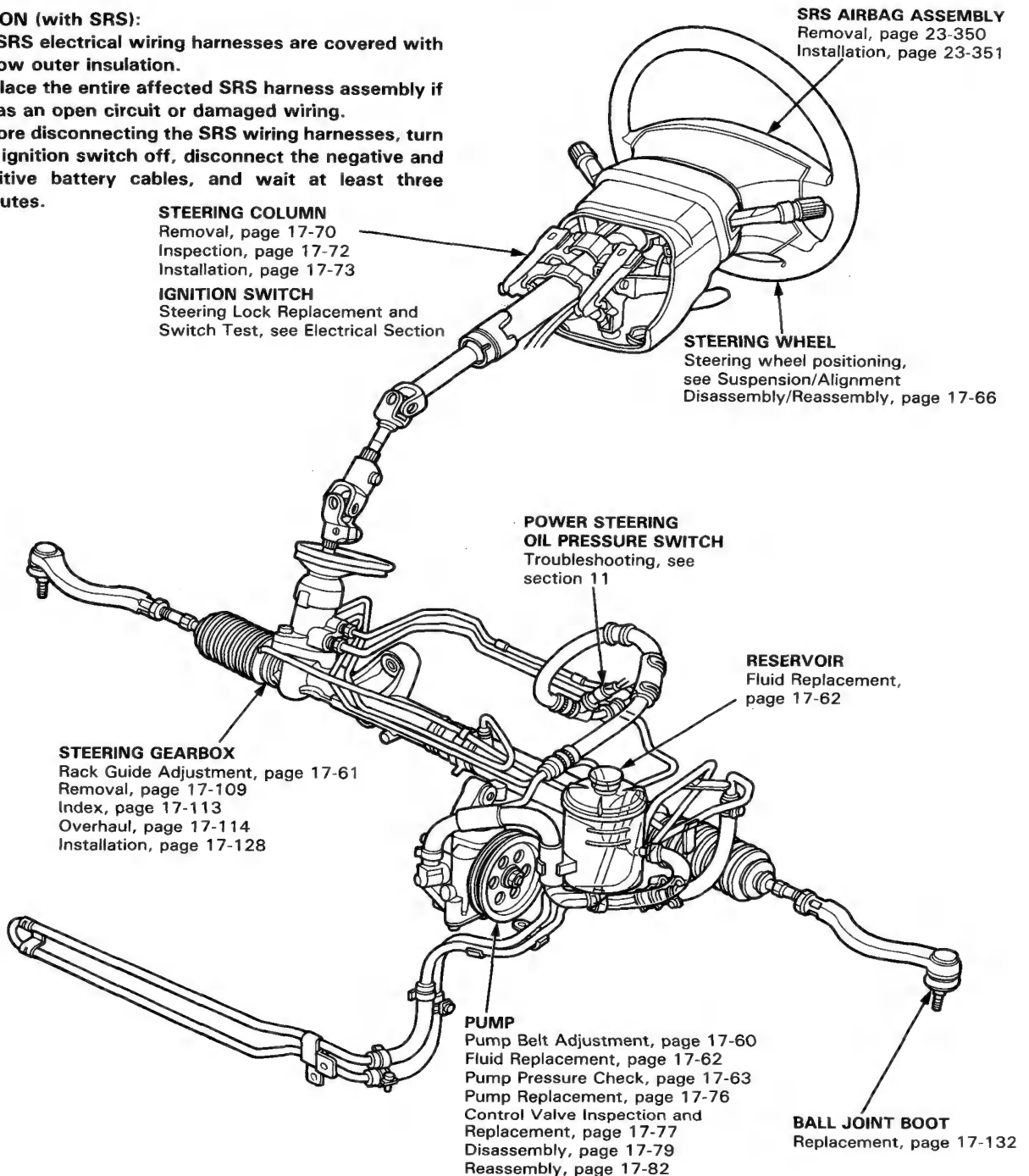
Index (RHD)

NOTE:

- Before removing the gearbox, remove the ignition key to keep the steering shaft from turning.
- If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).
- After installing the gearbox, check the wheel alignment and adjust if necessary.

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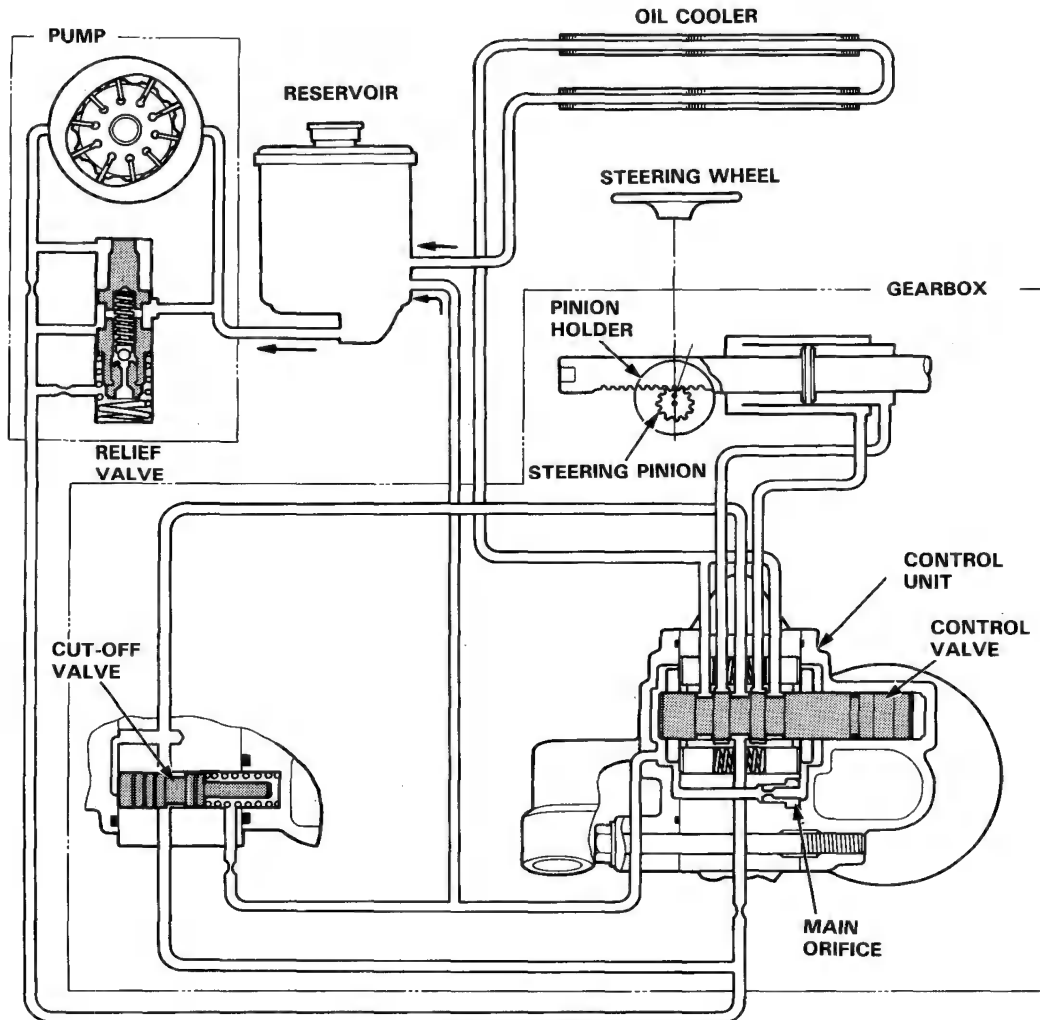
System Description (LHD)

Fluid Flow Diagram

The reservoir supplies power steering fluid to the pump; the pump pressurizes the fluid to about 8000 kPa (1200 psi), and delivers it through a high pressure hose to the control unit on the gearbox.

The control valve (in the control unit) controls the direction of the turn by shifting fluid to the left or right side of the piston on the rack (in the power cylinder). The cut-off valve, also in the control unit, controls the amount of assist by regulating the stroke of the control valve.

Fluid returning from the power cylinder flows back through the control valve and out to the reservoir through the cooler.

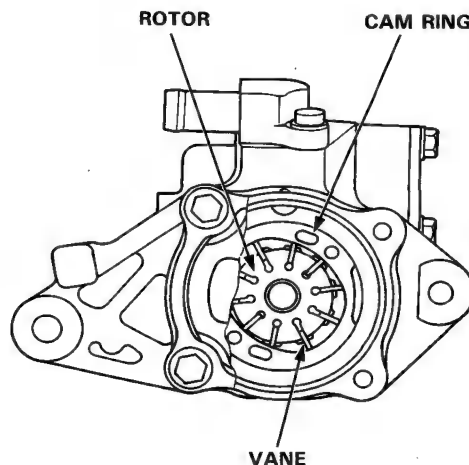
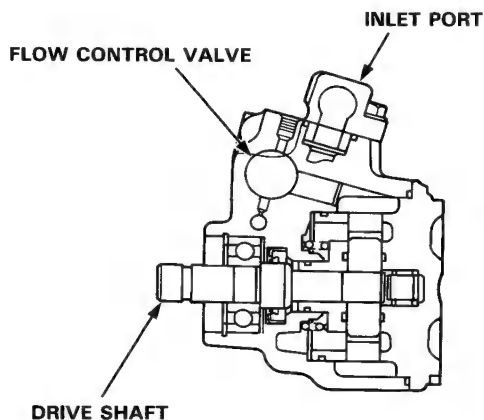




Steering Pump

Construction

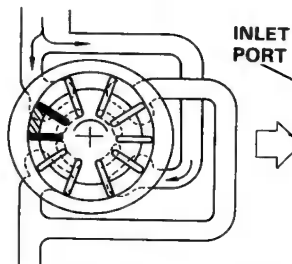
The pump is a vane-type incorporating a flow control valve (with an integrated relief valve) and is driven by a V-belt from the crank pulley. The pump features 10 vanes. Each vane performs two intake/discharge operations for every rotation of the rotor. This means that the hydraulic fluid pressure pulse becomes extremely small during discharge.



Operation

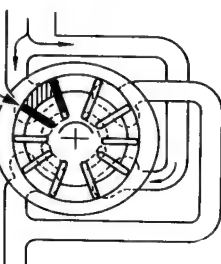
The belt-driven pulley rotates the rotor through the drive shaft. As the rotor rotates, the hydraulic pressure is applied to the vane chamber of the rotor and the vanes will rotate while being pushed onto the inner circumference of the cam ring. The inner circumference of the cam ring has an extended portion with respect to the center of the shaft, so the rollers move downward in the axial direction as the carrier rotates. As a result of this roller movement, the internal volume of the vane chamber will change, resulting in fluid intake and discharge.

START OF FLUID INTAKE



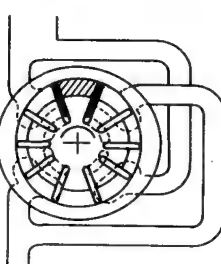
The vanes are pushed onto the inner circumference of the cam ring.

FLUID INTAKE



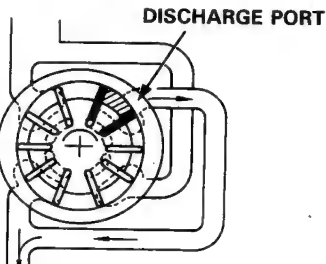
The volume of the vane chamber increases so that fluid is sucked in.

FLUID MOVEMENT



The sucked-in fluid moves toward the discharge port.

FLUID DISCHARGE



As the vanes return to their original position on the inner side, the volume of the vane chamber decreases so the fluid is discharged from the discharge port.

(cont'd)

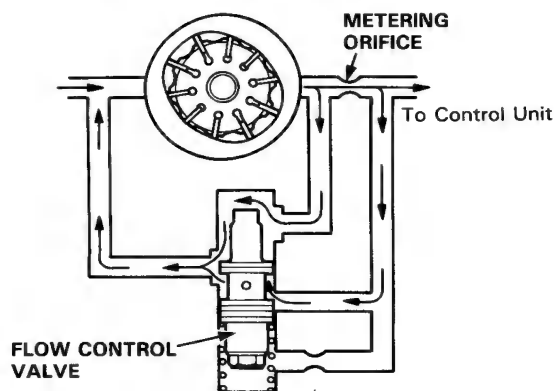


System Description (LHD)

Steering Pump (cont'd)

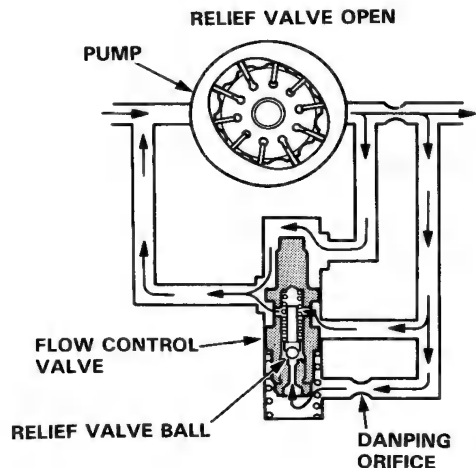
Flow Control

Fluid from the pump runs through a metering orifice to the control unit. This creates a pressure difference between the pump and control unit sides of the orifice. When pressure in the pump side is higher than the force of the spring holding the flow control valve closed, it pushes the valve down (open), and excess fluid returns to the pump inlet. The combined effect of the metering orifice and the flow control valve provides a relatively constant flow of fluid to the control unit.



Pressure Relief

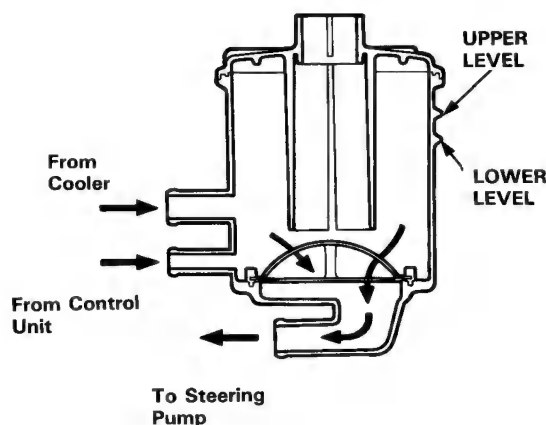
As pressure on the control unit side builds up it pushes the relief valve ball (inside the flow control valve) up against its spring, and excess fluid returns to the pump inlet. As the pressure under the flow control valve drops, the relief valve ball is closed by its spring, and the flow control valve is forced down again, allowing excess fluid from the pump side to return to the inlet. This flow control valve-relief valve cylinder keeps pump output pressure between 7845–8826 kPa (80–90 kg-cm², 1138–1280 psi).



Fluid Reservoir/Filter

A one piece reservoir and filter is attached to the fender apron on the left side of the engine compartment. The fluid and the filter/reservoir should be replaced if the system is opened for repairs, or if the fluid gets water or dirt in it.

CAUTION: Use only Honda Power Steering Fluid-V. The use of other fluid such as A.T.F., or other manufacturer's power steering fluid will cause damage to the system.

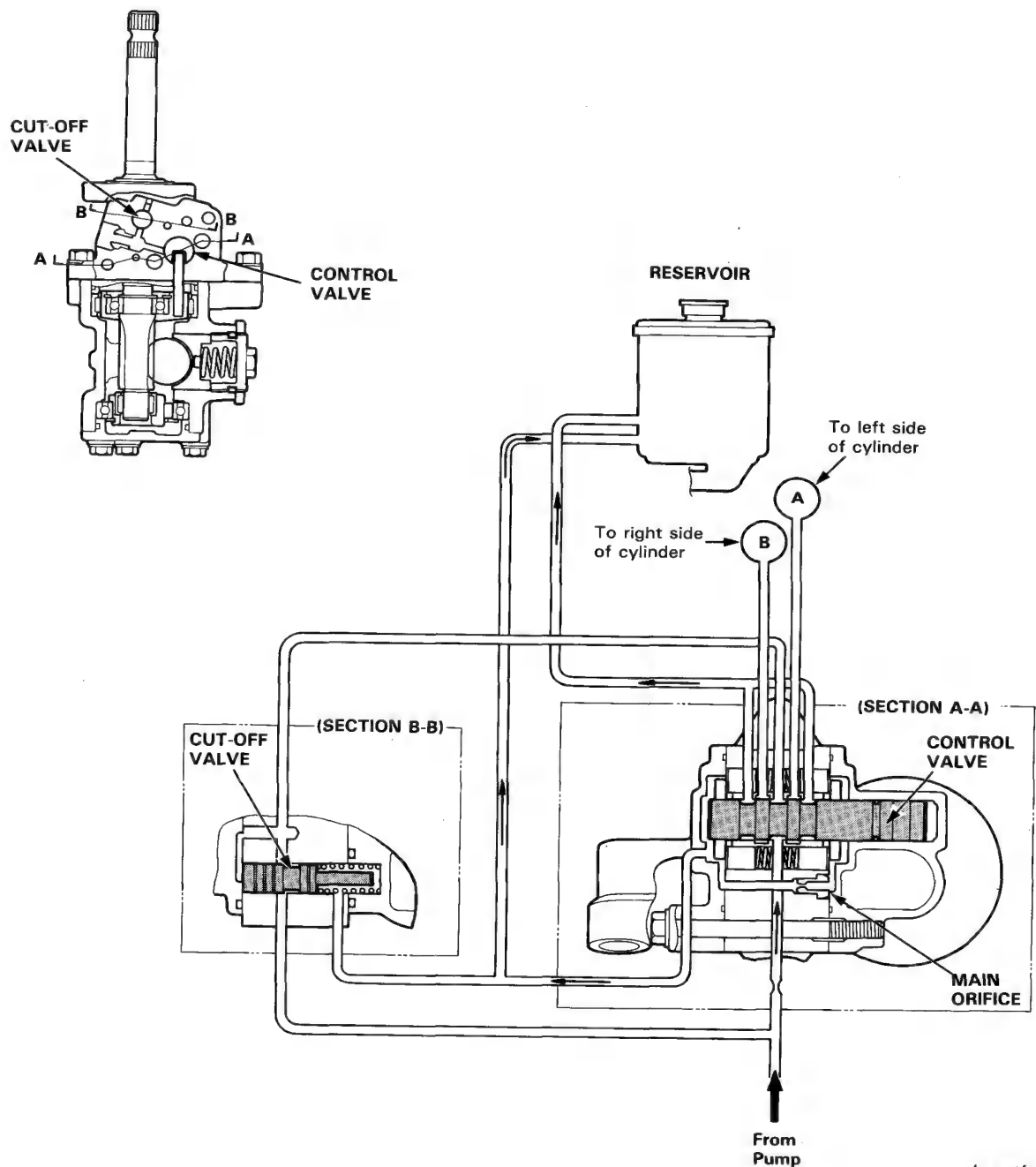


Reservoir Capacity 0.4 liter (0.42 U.S. qt., 0.35 Imp. qt.)
System Capacity 1.1 liter (1.17 U.S. qt., 0.97 Imp. qt.)



Control Valve

Mounted on the upper side of the gearbox is a control valve that is moved horizontally by a pin on the pinion holder to shift fluid pressure to the right or left side of the Power Cylinder when the steering wheel is turned. It has thrust pins at both ends, and two inter-connected reaction chambers, one on each side. Each reaction chamber contains a pair of spring loaded plungers that rise against right and left thrust pins. The valve body fluid passages are controlled by the control valve.



(cont'd)



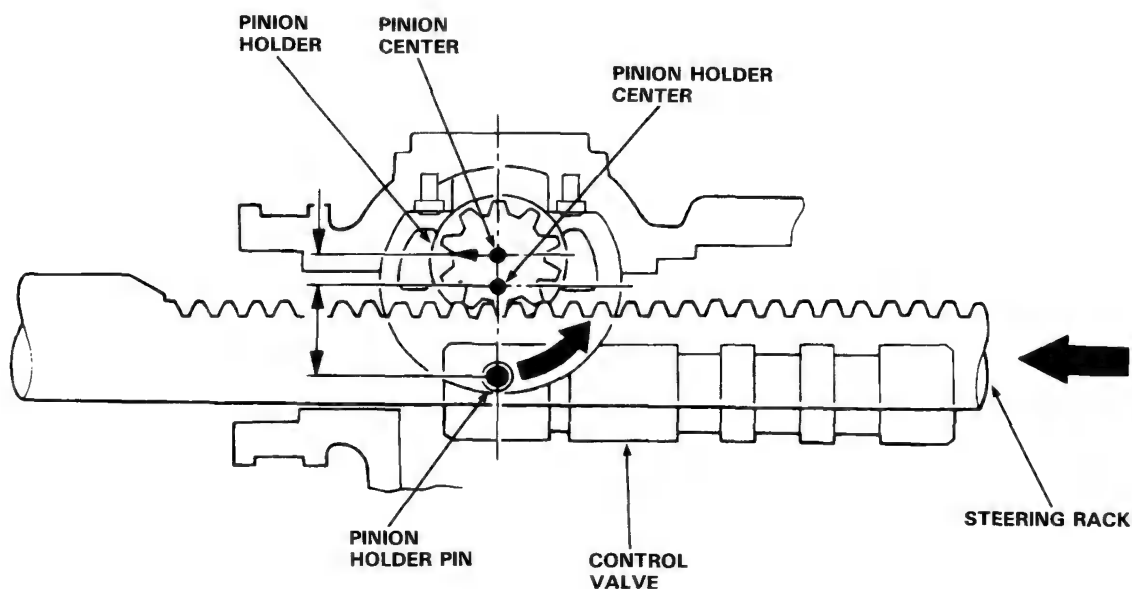
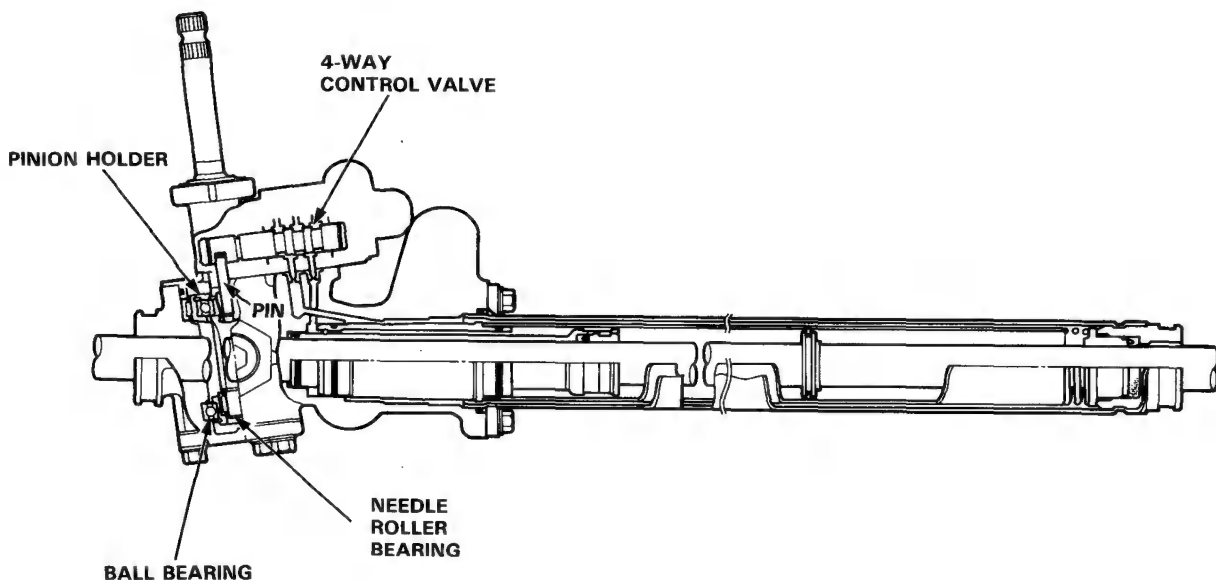
System Description (LHD)

Control Valve (cont'd)

In the power steering unit, the method used to direct a single source of fluid pressure in either of two directions (for left or right turns) involves the pinion gear transferring a "message" of direction to the fluid 4-way valve.

The pinion is mounted slightly off-center in a pair of bearings, which are in turn mounted in a Pinion Holder cylinder that rotates, centered in its own outer bearings. At the top of the Pinion Holder is a pin, which fits in a slot in the 4-way valve. As the pinion is turned (to turn left or right), because it is off-center, it also moves slightly along the rack. This movement is transferred to the holder. The pin in the holder then moves the 4-way valve, to direct fluid pressure to either side of the rack in the Power Cylinder.

The back edges of the pinion holder (facing away from the rack) hit the stops cast into both sides of the gear housing to avoid pushing the control valve too far in either direction. The front edge of the pinion holder cuts off assist at full lock as described on the next page.

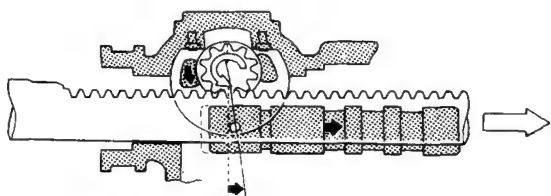




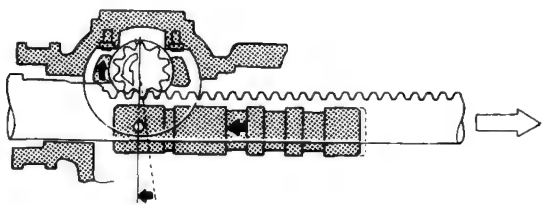
Full-Lock Unloader System

The 4-way valve shifts the direction of fluid flow when the steering wheel is turned right or left. However, when the wheel is turned to the right or left lock at parking speed, the edge of the pinion holder rides up on the end of the rack, moving the pin in the opposite direction which pulls the 4-way valve back to neutral.

This keeps pump pressure from building up (which could cause idle speed to drop), and improves steering feel by increasing resistance at left and right lock.



Control in "assist" position



Control valve moves back to "neutral" position

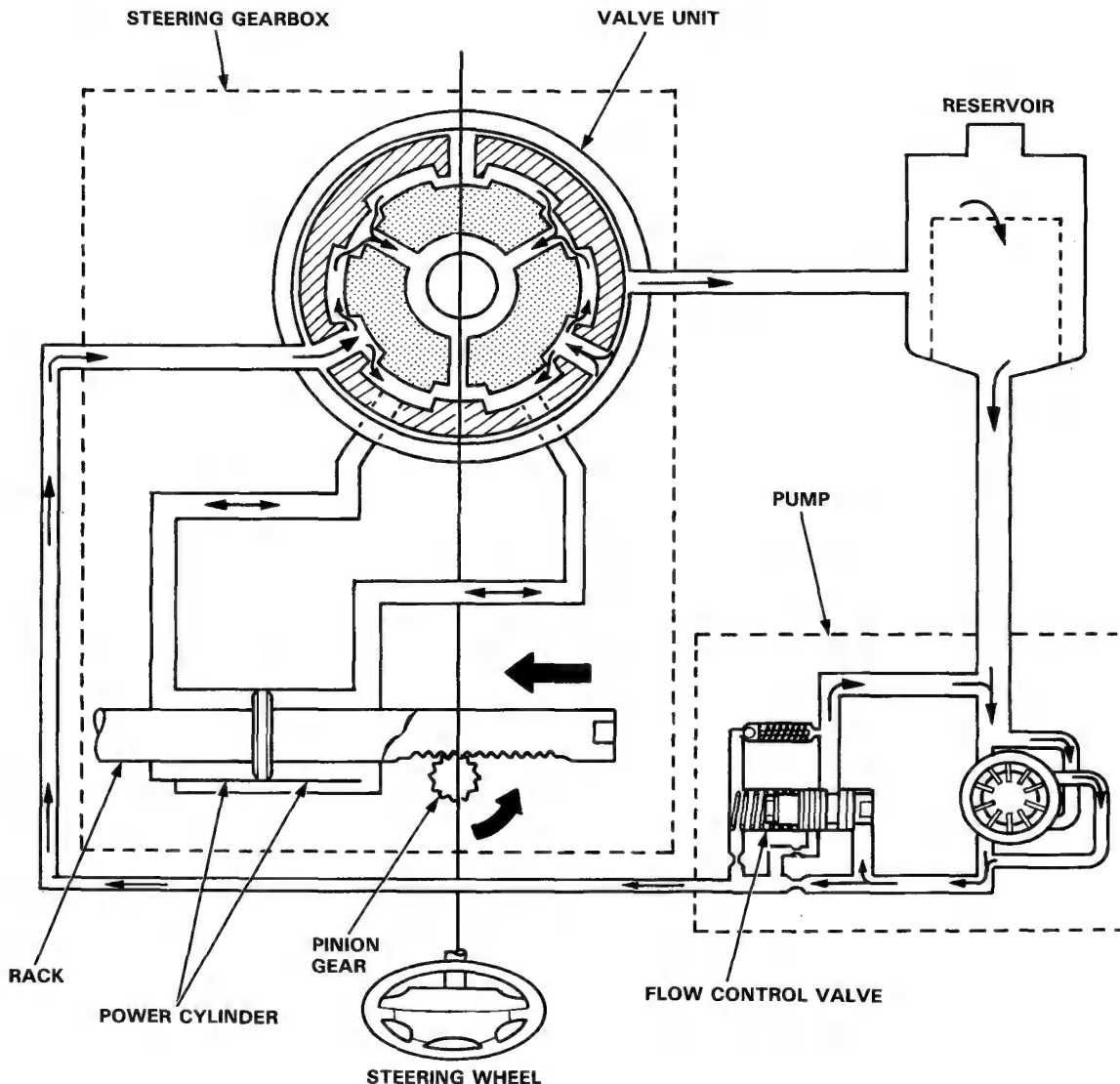
System Description (RHD)

Fluid Flow Diagram

The power steering of this car controls the power assistance with no stage. It is a compact rotary valve-type power steering which is excellent in hydraulic pressure sensing performance with the gearbox built in and equipped with the vane-type pump.

As the power assistance is automatically controlled in compliance with the reaction force of the road surface and car speed, i.e. the system makes the steering wheel light to turn when driving at low speed or when turning the wheel with the car stopped and it makes the steering wheel rather heavy to turn when driving at high speed, the driver feels the best and natural steering responses at all speeds. In addition, the driver can grasp the road condition well, too, as the reaction force of the road surface is adequately transmitted to the steering wheel.

The pump driven by the crank pulley pressurizes the steering fluid and delivers it to the valve unit around the pinion of the steering gearbox with the amount of fluid and pressure regulated by the flow control valve built in the pump. The rotary valve of the valve unit controls the hydraulic pressure and changes the direction of the flow, and the fluid flows to the power cylinder where rack thrust is generated. Fluid returning from the power cylinder flows back to the reservoir, where the fluid is "filtered" and supplied to the pump again.

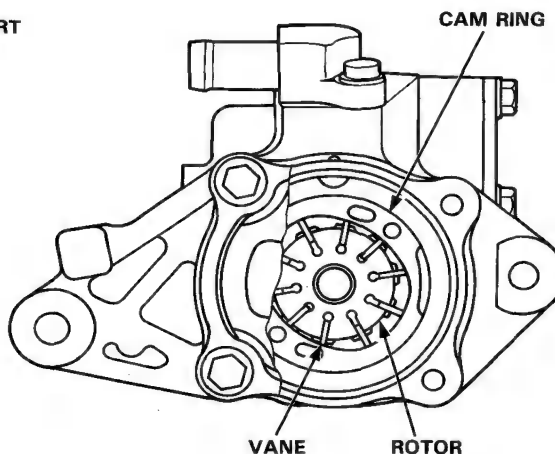
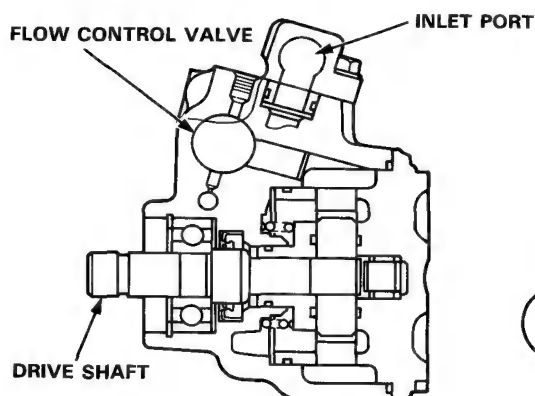




Steering Pump

Construction

The pump is a vane-type which gives the driver better steering response thanks to the large discharge volume of the pump and it has small hydraulic fluid pressure pulse during discharge. This reduced the "beat" noise caused by the pressure pulse during discharge making the pump being quiet while operation. The pump is incorporated with the flow control valve and controls the discharge volume and pressure in the pump.

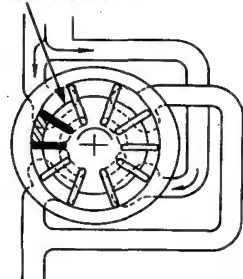


The vane-type pump consists of the vanes moving around the rotating rotor and the cam ring fixed outside the vanes. As the rotor rotates, the hydraulic pressure is applied to the vane chamber of the rotor and the vanes will rotate while being pushed onto the inner circumference of the cam ring. The vane chambers move in the rotating direction of the rotor changing the internal volume of the vane chambers according to the shape of the inner circumference of the cam ring, resulting in fluid intake and discharge.

The following drawings show the sequential movement of vane chambers from the intake to discharge operations. The same operation is made at the two facing vane chamber: in other words, each vane chamber performs two intake/discharge operations for every rotation of the rotor.

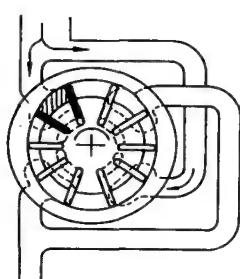
START OF FLUID INTAKE

INLET PORT



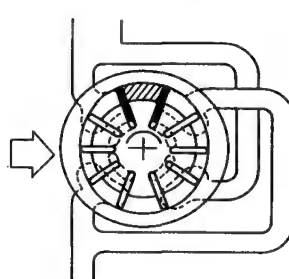
The internal volume of a vane chamber starts to increase and a vane chamber comes to the inlet port.

FLUID INTAKE



The internal volume of a vane chamber keeps increasing and the steering fluid is sucked into the chamber through the inlet port.

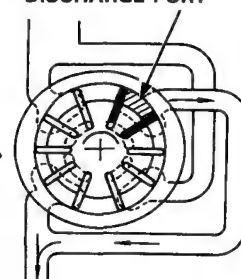
FLUID MOVEMENT



The inlet port closes as the vane chamber moves and the sucked-in fluid moves toward the discharge port.

FLUID DISCHARGE

DISCHARGE PORT



The internal volume of a vane chamber decreases according to the shape of the cam ring and the fluid in the vane chamber is pressurized and discharged from the discharge port.

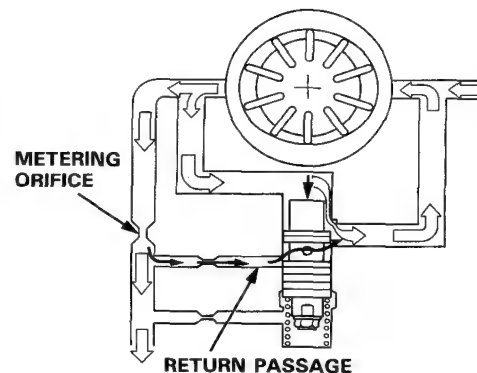
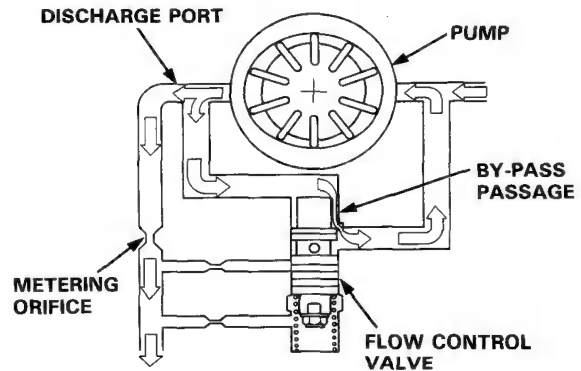
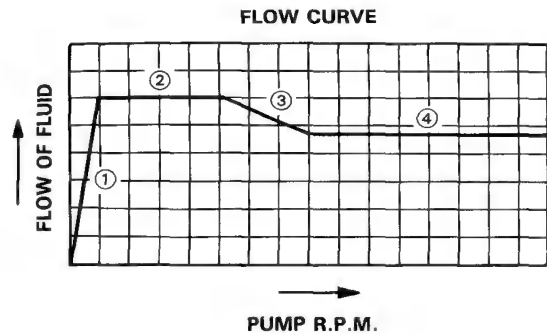
System Description (RHD)

Steering Pump (cont'd)

Flow Control

The flow control valve in the pump performs the following steps ① through ④ to control the flow of fluid, i.e. to increase the discharge volume when engine speed is low and to decrease it when the engine speed increases. The assistance thrust of the steering gearbox changes in compliance with the change in the discharge volume.

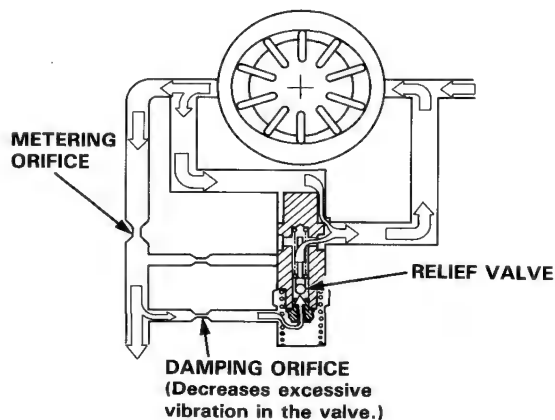
- ① When the engine starts, fluid discharged from the discharge port starts to run through the metering orifice in the pump. The discharge volume increases as the engine speed increases.
- ② As the flow has already been regulated by the metering orifice when the engine speed is at or near the idle speed, a constant and regulated amount of fluid is discharged until the engine speed reaches the middle speed range. As the engine speed increases, pressure difference between the ends of the metering orifice increases. The pressure difference is created between the top and bottom ends of the flow control valve, too, pushing the flow control valve to open the by-pass passage. This allows the excess fluid to return to the inlet port preventing pressure at the discharge port from rising excessively.
- ③ As the engine speed increases more, the flow control valve is pushed back further. With the engine speed reached at a given speed, the return passage outside the metering orifice is connected to the inlet port and the opening to the inlet port widens in proportion to increase of the engine speed. This makes part of fluid regulated by the metering orifice return to the inlet port of the pump; thereby discharged fluid from the pump is decreased slowly by this amount.
- ④ The flow of fluid discharged from the pump is regulated and maintained at a given level until and engine speed reaches to the high speed range thanks to the orifice in the return passage.





Pressure Relief

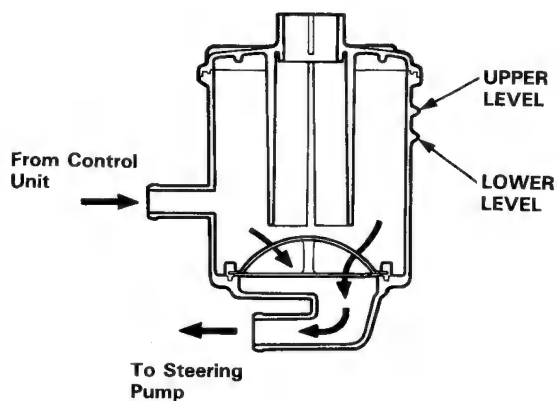
Pressure outside of the metering orifice is directed to the bottom of the flow control valve. When the pressure builds up, the relief valve in the flow control valve opens to relieve the pressure. As the flow control valve is pushed back by the pressure difference this time, the flow of fluid in the bypass passage increases controlling the pressure outside the metering orifice. The above operations are repeated to provide constant discharge pressure from the pump.



Fluid Reservoir/Filter

A one piece reservoir and filter is attached to the fender apron on the left side of the engine compartment. The fluid and the filter/reservoir should be replaced if the system is opened for repairs, or if the fluid gets water or dirt in it.

CAUTION: Use only Honda Power Steering Fluid-V. The use of other fluid such as A.T.F., or other manufacturer's power steering fluid will cause damage to the system.

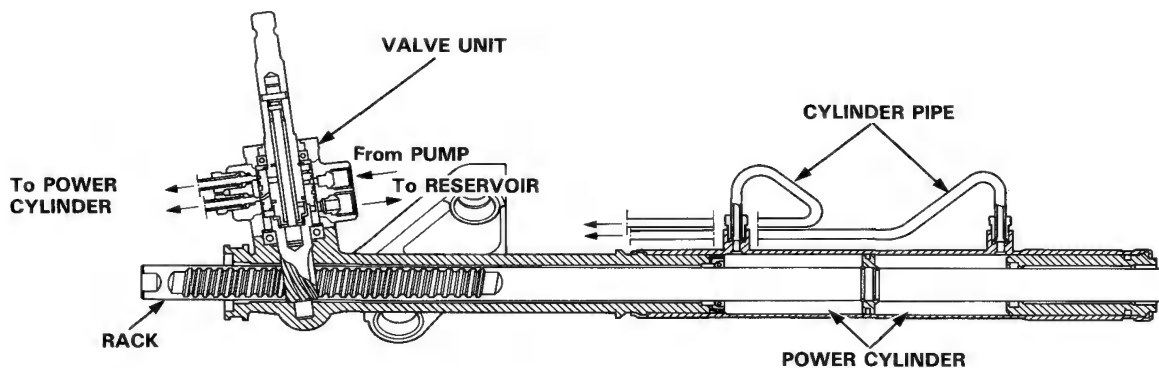


Reservoir Capacity 0.4 liter (0.42 U.S. qt., 0.35 Imp. qt.)
System Capacity 1.0 liter (1.07 U.S. qt., 0.87 Imp. qt.)

System Description (RHD)

Steering System

The rack-and-pinion type steering gearbox is simple in structure which has the valve unit controlling the steering fluid pressure. Steering fluid from the pump is regulated by the valve unit and is sent through the cylinder pipe to the power cylinder, where the rack thrust is generated. While, steering fluid in another power cylinder returns through the cylinder pipe and valve unit to the reservoir.



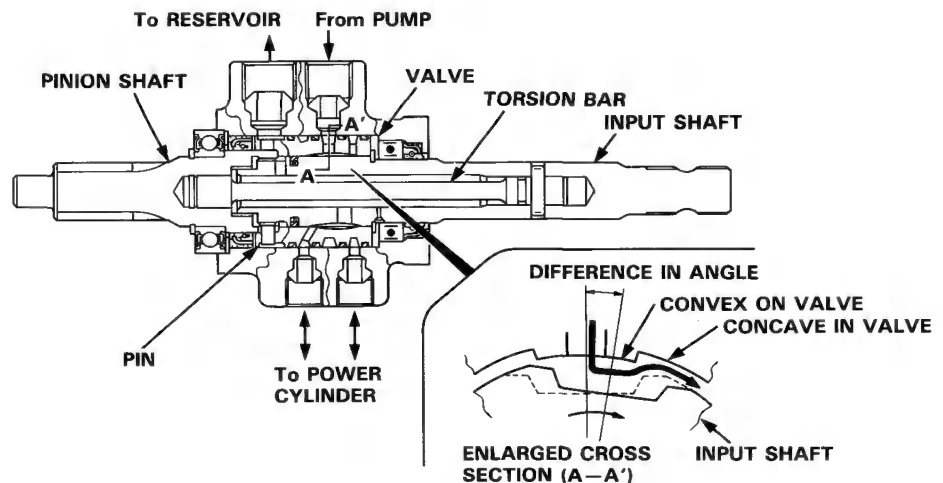
Valve Unit

Inside the valve unit is the valve which is coaxial with the pinion and controls the steering fluid pressure. The valve unit case is connected with the oil pipe from the pump, return pipe to the pump, and the two cylinder pipes from the respective power cylinder.

The pinion is double structured with the input shaft connected to the steering shaft equipped with the pinion gear, both of which are interconnected with the torsion bar.

The pin inserted in the valve and the pinion shaft groove engage: this allows the pinion shaft to rotate together with the valve. Because of this construction, difference in angle in the circumferential direction between the input shaft and valve becomes large according to the torsional strength of the pinion or reaction force of the road. However, maximum torsion between the shafts is regulated by the engaged splines of the shafts at the pin engagement section to hold the torsion bar within the set value.

This allows the steering system to function as the ordinal rack-and-pinion type steering when steering fluid is not pressurized because of the faulty pump.



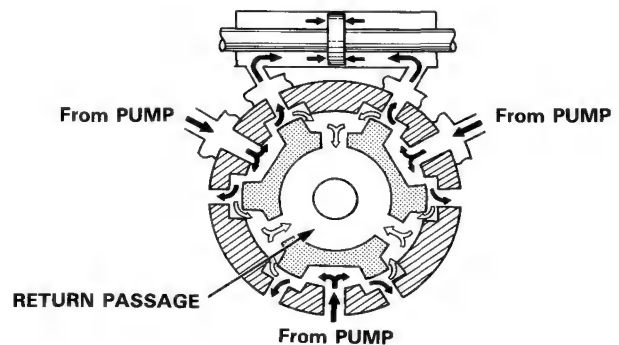
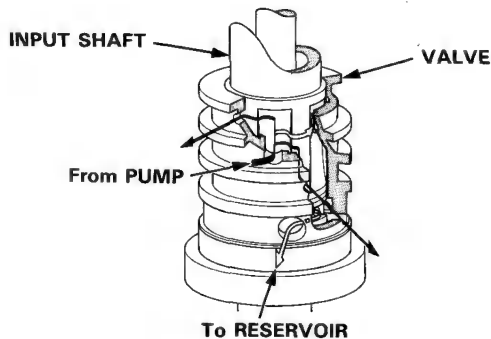


Pressure Control

No reaction force of the road surface:

When there is no reaction force of the road surface, the input shaft is in the neutral position, i.e. right and left orifices between the input shaft and the valve are equal.

As each orifice is equal in length and fully open, feed pressure from the pump is bypassed to the reservoir. Because of this operation, pressure in the power cylinder does not increase, resulting in small power assistance when reaction force of the road surface is small such as when driving at high speed or when driving straight forward.

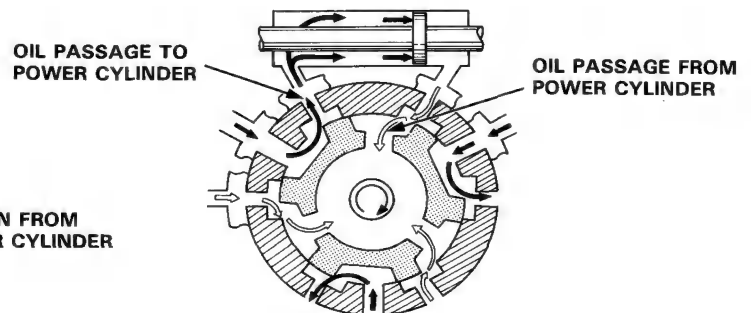
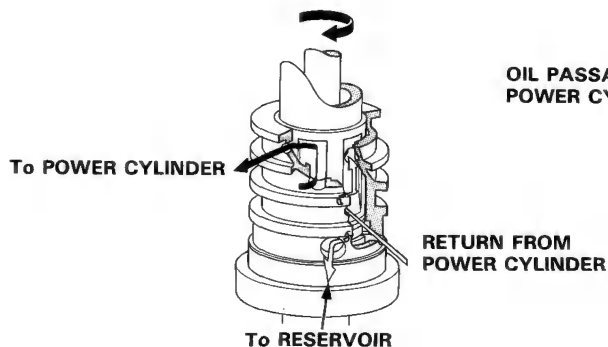


Large reaction force of the road surface:

When reaction force of the road surface is large such as when driving at low speed or when turning the wheel with the car stopped, difference in angle is created between the input shaft and valve opening the oil passages of one side and closing the oil passages of the other side.

Oil pressure in the power cylinder of the enlarged oil passage side increases to produce the rack thrust; thereby the steering wheel can be operated with light force. While, the return passage from another power cylinder opens to return the steering fluid in the return passage in the input shaft to the reservoir.

The oil passages to the power cylinder automatically changes in size according to the reaction force of the road surface; in other words, the passages enlarge and power assistance increases when reaction force of the road surface is large. While the passages become small and power assistance decreases when reaction force of the road surface is small.



(cont'd)

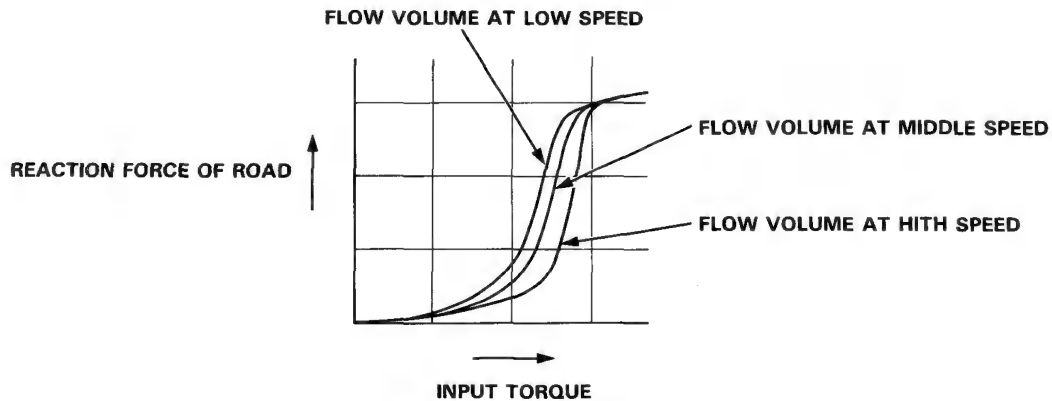
System Description (RHD)

Steering System (cont'd)

Hydraulic performance of power cylinder:

Though pressure from the pump is maintained at a constant valve, the steering system is designed to discharge large volume of fluid when pump speed. This change in discharge volume changes the hydraulic performance of the power cylinder, too. Where the areas of orifice of the valve unit are equal, pressure in the power cylinder is proportional to the pump discharge volume squared.

Therefore, the steering response is light when the discharge volume is large and the steering response is heavy when the discharge volume is small. The combined effect of these characteristics provides the best steering performance.



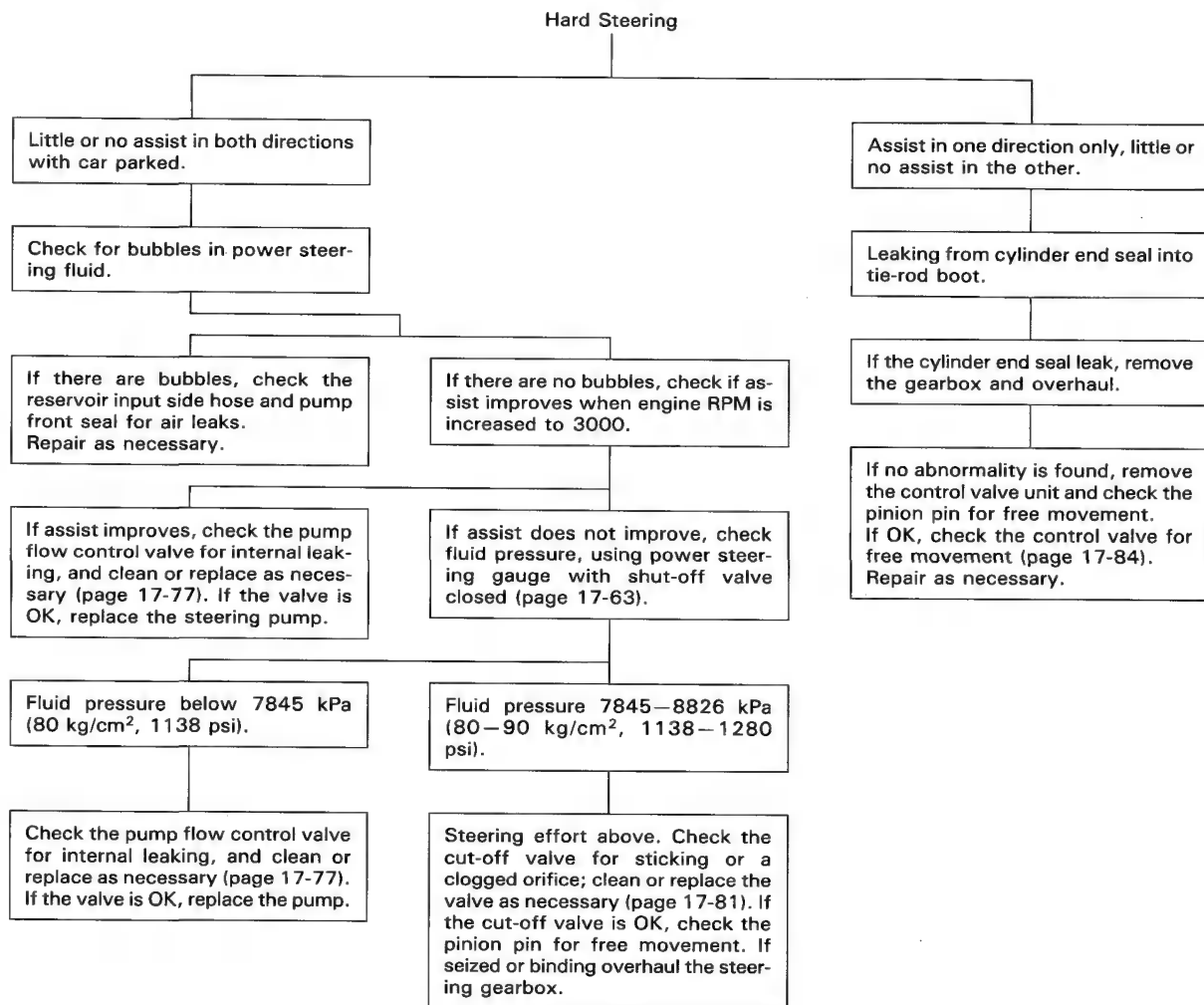


Troubleshooting (LHD)

General Troubleshooting

Check the following before you begin:

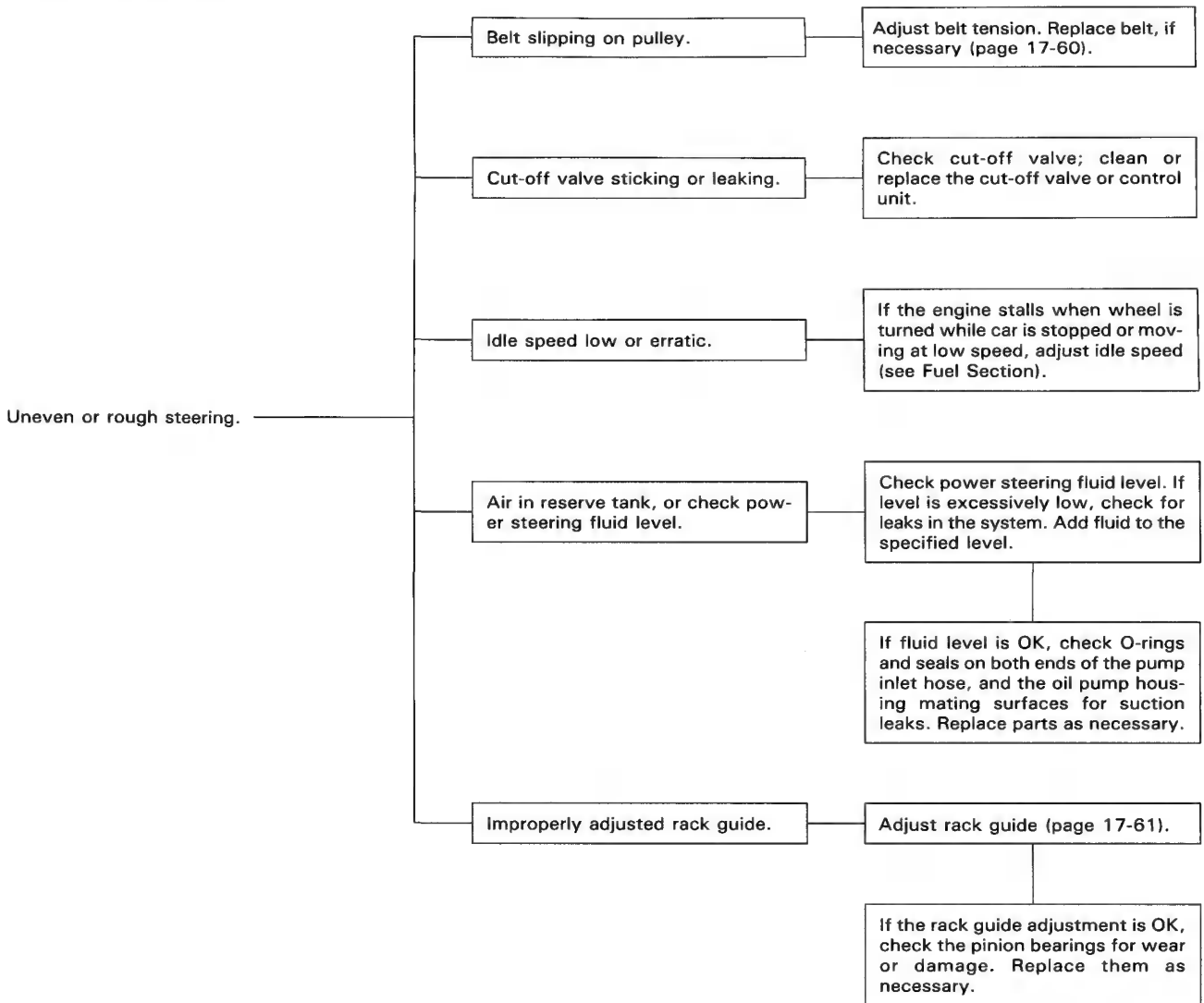
- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?



(cont'd)

Troubleshooting (LHD)

General Troubleshooting (cont'd)





Shock or vibration when wheel is turned to full lock.

Pump belt slipping on pulley (pump stops momentarily).

Adjust belt tension (page 17-60) or replace belt.

Set the power steering pressure gauge. Close the shut-off valve fully and measure the pump pressure (see page 17-63).

Check if pump pressure is within the range 7845–8826 kPa (80–90 kg/cm², 1138–1280 psi) and the gauge needle travel is ± 490 kPa (± 5 kg/cm², ± 70 psi) or less. Check the flow control valve if the needle travel exceeds ± 490 kPa (± 5 kg/cm², ± 70 psi) (see page 17-77). If the flow control valve is normal, replace the pump as an assembly.

Steering kicks back during wide turns.

Pump belt slipping.

Adjust belt tension (page 17-60) or replace belt.

Sticking cut-off valve or control valve.

Replace cut-off valve or control valve.

Rack guide adjusted too loose.

Adjust rack guide (page 17-61).

Wheel will not return smoothly.

Tire pressure too low.

Inflate to correct pressure.

Improper front wheel alignment.

Readjust front wheel alignment or replace parts as necessary.

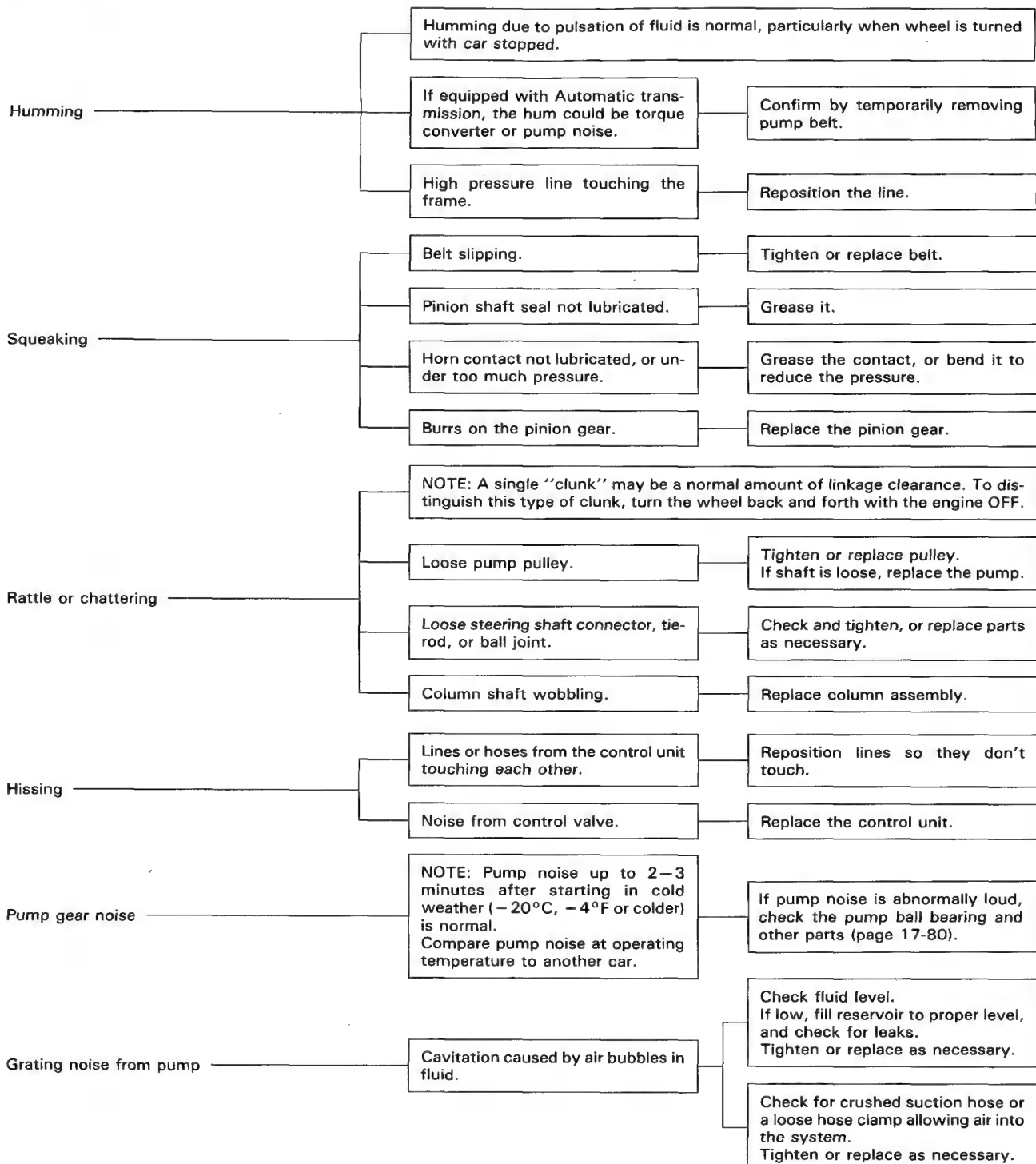
Improperly adjusted rack guide.

Adjust rack guide (page 17-61).

Troubleshooting (LHD)

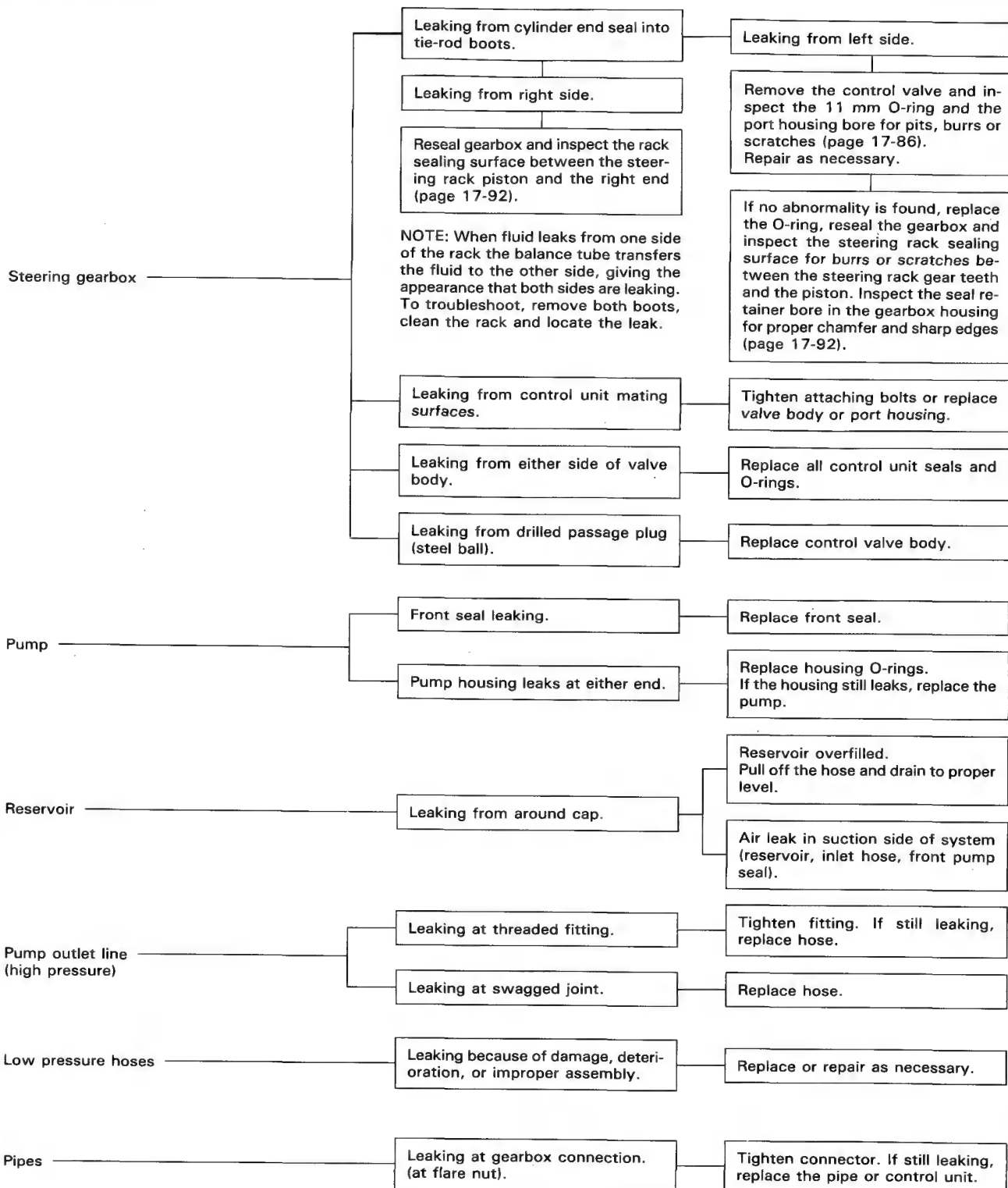
Noise and Vibration

NOTE: Pump noise in first 2—3 minutes after starting in cold weather (-20°C , -4°F or colder) is normal.





Fluid Leaks

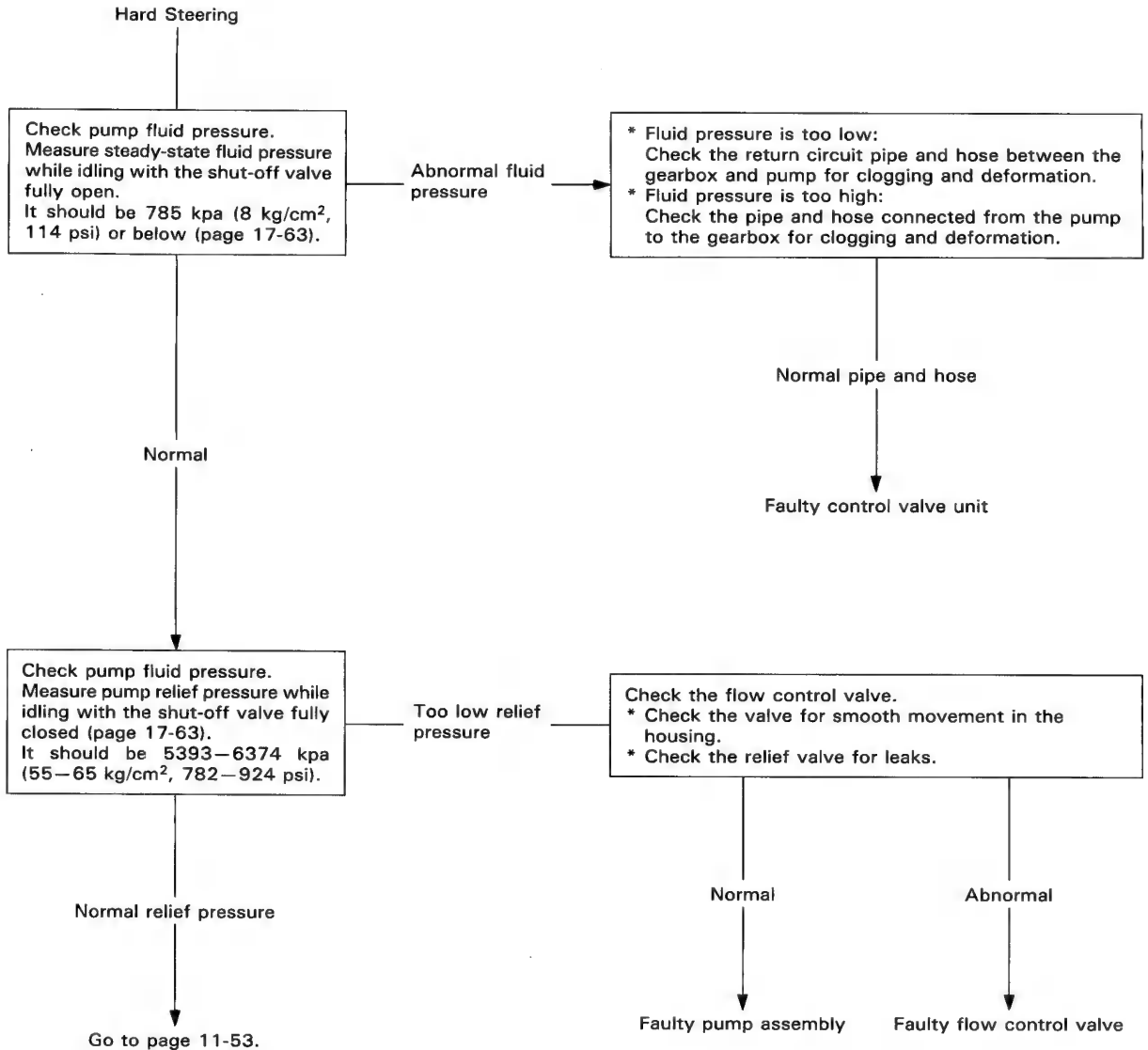


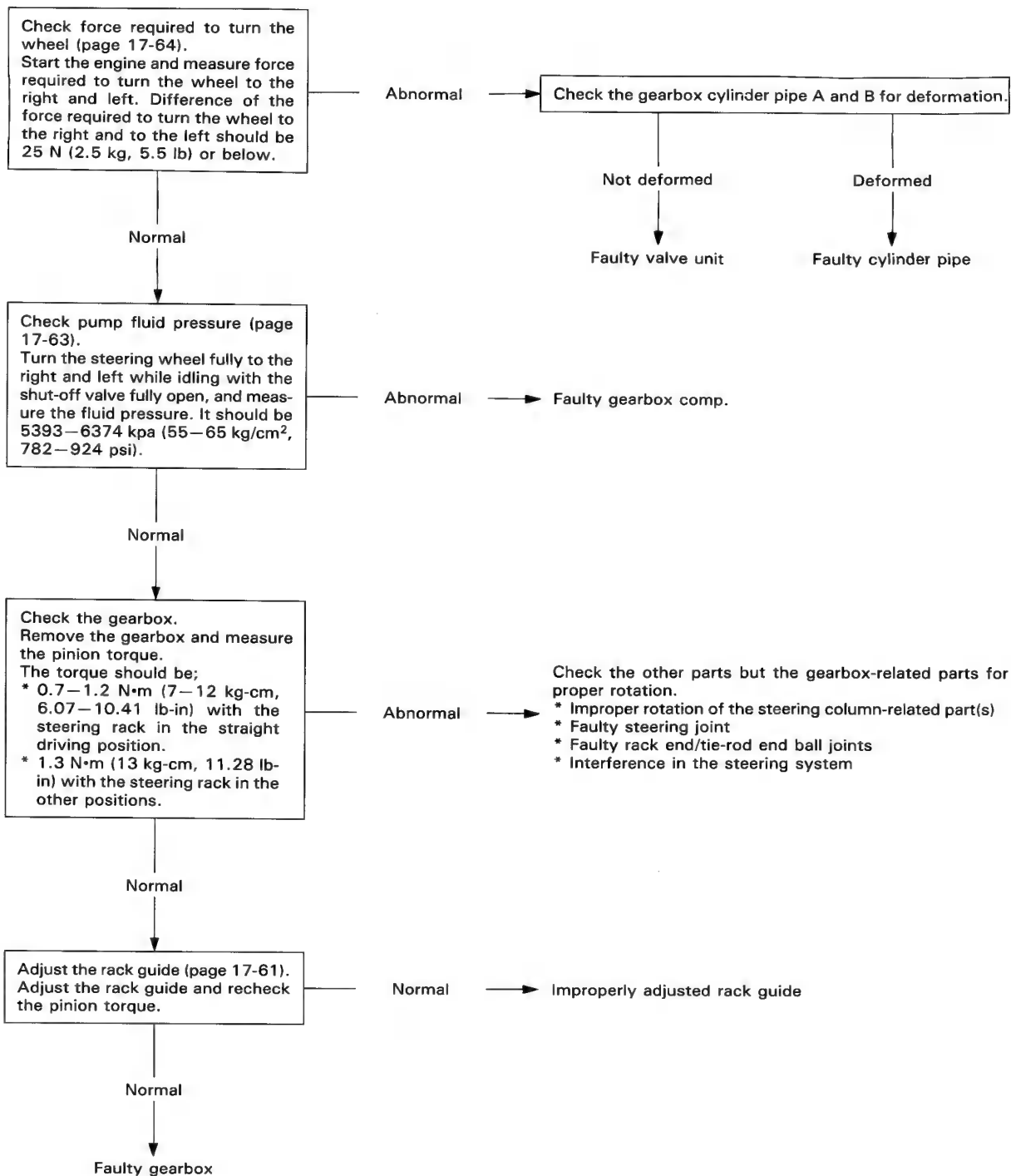
Troubleshooting (RHD)

General Troubleshooting

Check the following before you begin:

- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?





(cont'd)

Troubleshooting (RHD)

General Troubleshooting (cont'd)

Assist (excessively light steering) at high speed.

Park the car on dry paved surface. Raise the engine speed to 3,000 rpm and measure force required to turn the wheel.

When force is 25 N (2.5 kg, 5.5 lb) or below, replace the control valve unit as an assembly.

Force is proper.

Adjust the rack guide (page 17-61).

If the problem is not corrected by adjusting the rack guide, replace the gearbox comp.

Shock or vibration when wheel is turned to full lock.

Check the rack guide for proper adjustment (page 17-61).

Rack guide was backed off excessively.

Adjust.

If the problem is not corrected by adjusting the rack guide, replace the gearbox comp.

Rack guide is adjusted properly.

Check the belt for slip and adjust as necessary (page 17-60).

Wheel will not return smoothly.

Check the cylinder pipe A and B for deformation.

If either one or both of the cylinder pipe A and B is/are deformed, replace.

If the cylinder pipe A and B are normal, remove the gearbox from the frame and measure the pinion torque on the gearbox.

It should be 0.7–1.2 N·m (7–12 kg-cm, 6.07–10.41 lb-in) or below with the steering rack in the straight driving position, and 1.3 N·m (13 kg-cm, 11.28 lb-in) or below with the steering rack in the other positions.

If the measurements are out of specifications, adjust the rack guide.

If the problem is not corrected by adjusting the rack guide, replace the gearbox comp.



Uneven or rough steering.

Improperly adjusted rack guide.

Adjust rack guide (page 17-61).

If the problem is not corrected by adjusting the rack guide, replace the gearbox comp.

Belt slipping on pulley.

Adjust belt tension. Replace belt, if necessary (page 17-60).

Idle speed low or erratic.

If the engine stalls when wheel is turned while car is stopped or moving at low speed, adjust idle speed (see Fuel Section).

Air in reserve tank, or check power steering fluid level.

Check power steering fluid level. If level is excessively low, check for leaks in the system. Add fluid to the specified level.

If fluid level is OK, check O-rings and seals on both ends of the pump inlet hose, and the oil pump housing mating surfaces for suction leaks. Replace parts as necessary.

Steering kicks back during wide turns.

Pump belt slipping on pulley (pump stops momentarily).

Adjust belt tension (page 17-60) or replace belt.

Set the power steering pressure gauge. Close the shut-off valve fully and measure the pump pressure (see page 17-63).

Check if pump pressure is within the range 5393–6374 kPa (55–65 kg/cm², 782–924 psi) and the gauge needle travel is ± 490 kPa (± 5 kg/cm², ± 70 psi) or less. Check the flow control valve if the needle travel exceeds ± 490 kPa (± 5 kg/cm², ± 70 psi) (see page 17-77). If the flow control valve is normal, replace the pump as an assembly.

Troubleshooting (RHD)

Noise and Vibration

NOTE: Pump noise in first 2—3 minutes after starting in cold weather (-20°C , -4°F or colder) is normal.

Humming

Humming due to pulsation of fluid is normal, particularly when wheel is turned with car stopped.

If equipped with Automatic transmission, the hum could be torque converter or pump noise.

Confirm by temporarily removing pump belt.

High pressure line touching the frame.

Reposition the line.

Squeaking

Pinion shaft seal not lubricated.

Grease it.

Horn contact not lubricated, or under too much pressure.

Grease the contact, or bend it to reduce the pressure.

Rattle or chattering

Loose steering shaft connector, tie-rod, or ball joint.

Check and tighten, or replace parts as necessary.

Column shaft wobbling.

Replace column assembly.

Check the rack guide for proper adjustment (page 17-61).

Adjust, if necessary.

Rattling sound and feeling when turning the steering wheel right and left with the engine OFF is a sound when the valve unit contacts the stopper. This is normal.

Striking sound when turning the steering wheel fully right or left is a sound when the rack end contacts the stopper. This is normal.

Hissing

Pump noise, though not loud, from the control valve can be heard when turning the steering wheel right or left. This is normal.



Grating noise from pump

Cavitation caused by air bubbles in fluid.

Check fluid level.
If low, fill reservoir to proper level,
and check for leaks.
Tighten or replace as necessary.

Check for crushed suction hose or
a loose hose clamp allowing air into
the system.
Tighten or replace as necessary.

Pump gear noise

NOTE: Pump noise up to 2–3
minutes after starting in cold
weather (-20°C , -4°F or colder)
is normal.
Compare pump noise at operating
temperature to another car.

If pump noise is abnormally loud,
check the pump ball bearing and
any parts. (page 17-60).

Troubleshooting (RHD)

Fluid Leaks

- Check the gearbox assembly for oil leaks carefully. Oil can leak out of various points, depending on location of the faulty oil seals/seal rings. Check the following before removing the gearbox from the frame.

Steering Gearbox

Leaking from the oil seal on the top of the valve housing.

Replace the valve oil seal from the valve housing.

Leaking from cylinder end into right tie-rod boot.

Replace the valve oil seal from the pinion shaft.

Replace the cylinder packing A.

Leaking from cylinder end into left tie-rod boot.

Replace the cylinder packing B or O-ring of the seal holder.

Leaking from the control valve unit/housing mounting section.

Tighten attaching bolts or replace the control valve unit or gear housing.

Pipes

Leaking from cylinder pipe A or B connection. (at flare nut)

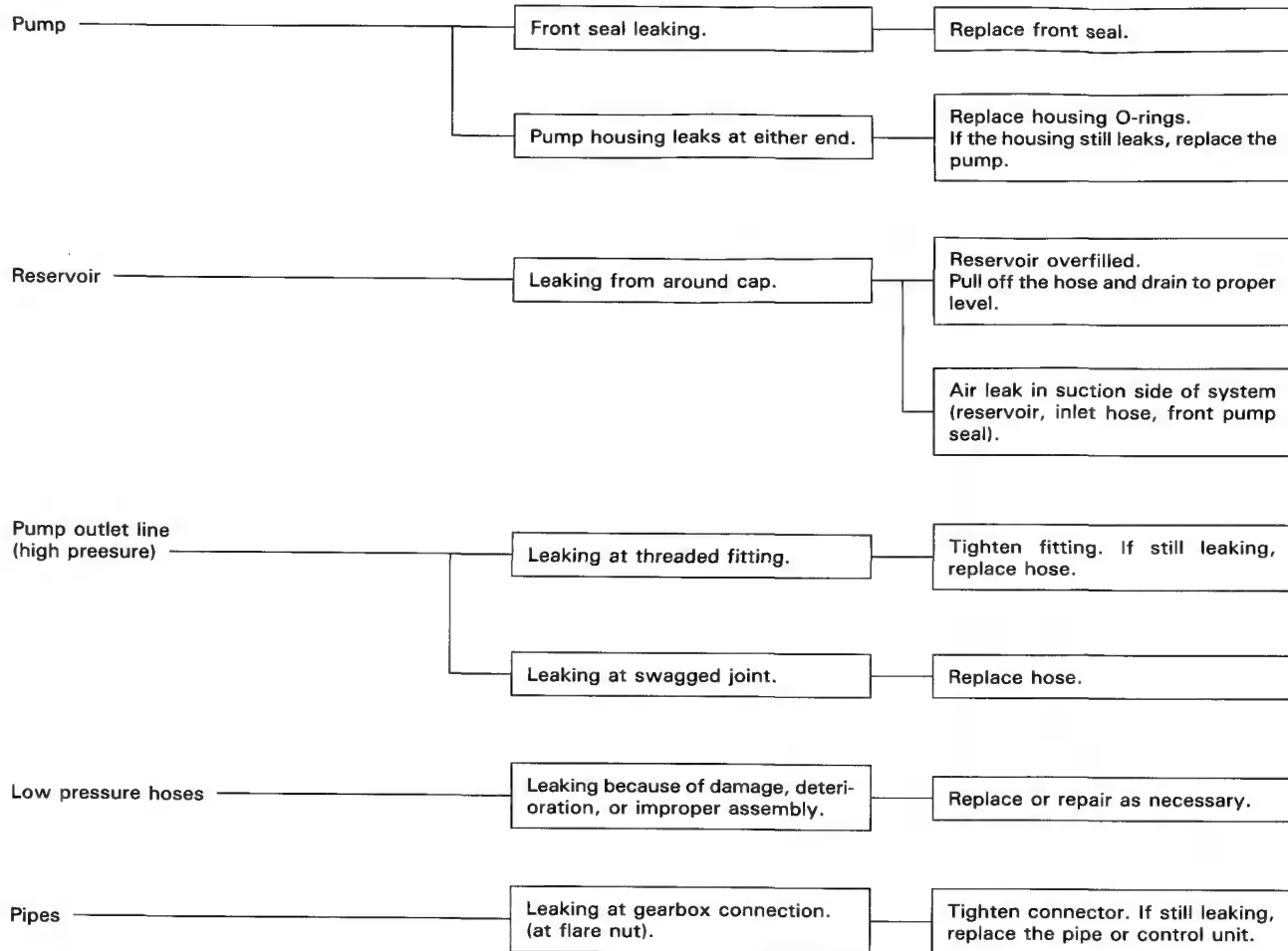
Tighten connector. If still leaking, replace the pipe, cylinder or control unit.

Leaking caused by damaged pipe A or B.

Replace the pipe A or B.

Leaking from feed pipe and return pipe of the control valve. (at flare nut)

Tighten connector. If still leaking, replace the pipe or control valve.



Maintenance

Pump Belt Adjustment

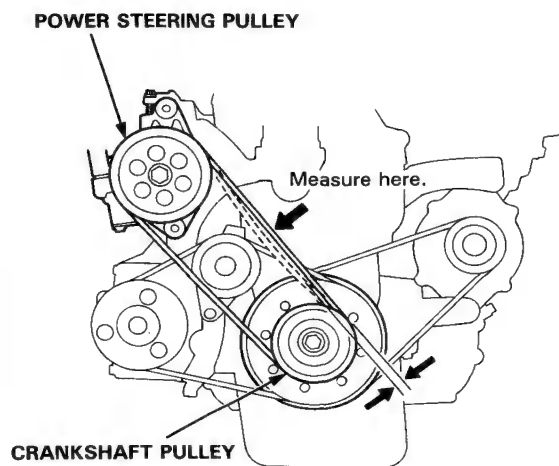
1. Apply a force of 100 N (10 kg, 22 lb) and measure the deflection between the P/S pump and the crankshaft pulleys.

Deflection:

Used Belt: D16A Engine 8.0–12.0 mm
(0.31–0.47 in)
Other engine 8.0–12.0 mm
(0.31–0.47 in)

New Belt: D16A Engine 5.5–9.0 mm
(0.22–0.35 in)
Other engine 6.0–9.5 mm
(0.24–0.37 in)

NOTE: If there are cracks or any damage evident on the belt, replace it with a new one.



Test by the Belt Tension Gauge; 07JGG-0010100. Attach the tension gauge to the belt and measure the tension of the belt.

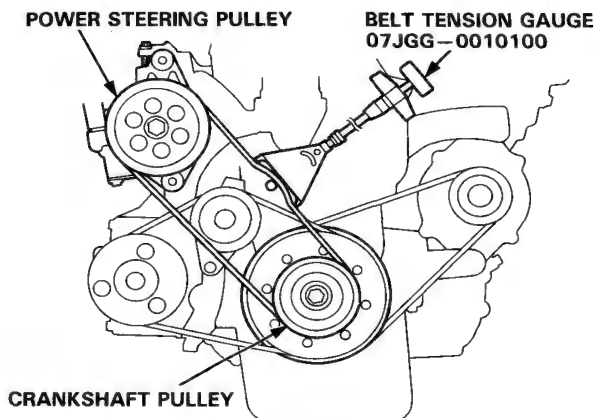
Tension:

Used Belt: D16A Engine 350–500 N
(35–50 kg, 77–110 lb)
Other engine 350–500 N
(35–50 kg, 77–110 lb)

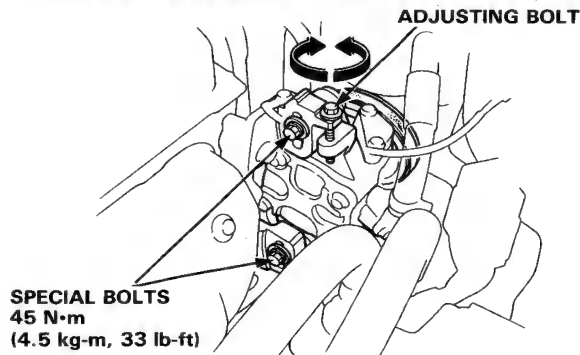
New Belt: D16A Engine 550–750 N
(55–75 kg, 121–165 lb)
Other engine 500–700 N
(50–70 kg, 110–154 lb)

NOTE:

- If there are cracks or any damage evident on the belt, replace it with a new one.
- See the instructions for the tension gauge.



2. Loosen the P/S pump mounting bolts.
3. Turn the adjusting bolt to get the proper belt tension, then retighten the bolts.
4. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.



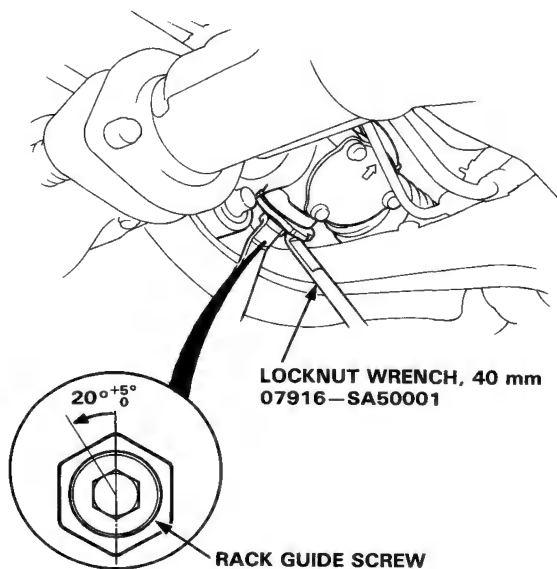
On-Car Checks



Rack Guide Adjustment

LHD:

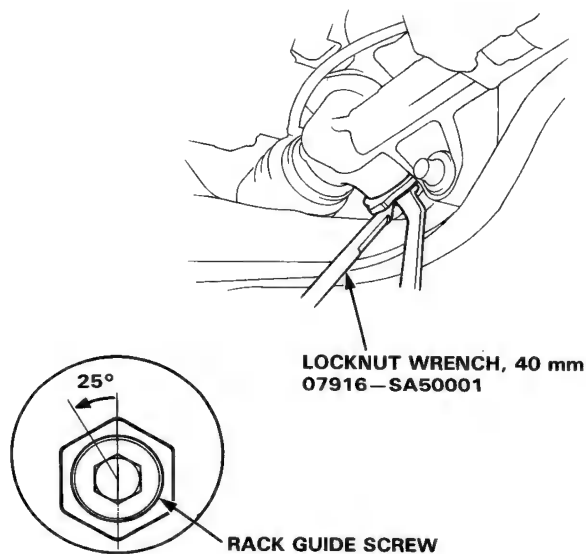
1. Loosen the rack guide screw locknut with the special tool.
2. Tighten, loosen and retighten the rack guide screw two times to 4 N·m (0.4 kg-m, 2.9 lb-ft), then back it off $20^{\circ} \pm 5^{\circ}$.
3. Tighten the locknut to about 25 N·m (2.5 kg-m, 18 lb-ft) while preventing the guide screw from turning.



4. Check for tight or loose steering through the complete turning travel.
5. Recheck steering assist (page 17-64).

RHD:

1. Loosen the rack guide screw locknut with the special tool.
2. Tighten, loosen and retighten the rack guide screw two times to 5 N·m (0.5 kg-m, 3.6 lb-ft), then back it off 25° .
3. Tighten the locknut to about 68 N·m (6.8 kg-m, 49 lb-ft) while preventing the guide screw from turning.



4. Check for tight or loose steering through the complete turning travel.
5. Recheck steering assist (page 17-64).

On-Car Checks

Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

CAUTION: Use only **GENUINE HONDA Power Steering Fluid-V**. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

Fluid Replacement

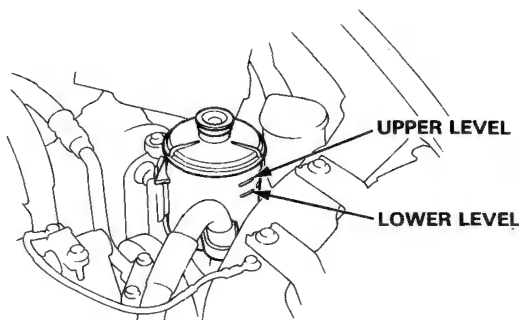
SYSTEM CAPACITY:

LHD: 1.1 liter (1.17 U.S.qt, 0.97 Imp qt)

RHD: 1.0 liter (1.07 U.S.qt, 0.87 Imp qt)

RESERVOIR CAPACITY:

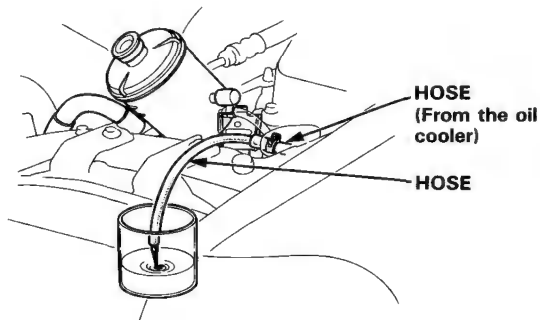
0.4 liter (0.42 U.S.qt, 0.35 Imp qt)



1. Raise the reservoir and disconnect the hose that goes to the oil cooler.
2. Connect a hose of suitable diameter to the disconnected hose that goes to the oil cooler and put the hose end in a suitable container.

CAUTION: Take care not to spill the fluid on the body and parts. Wipe off the spilled fluid at once.

3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.



4. Refit the return hose on the reservoir.
5. Fill the reservoir to the upper level mark.
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add some if necessary.

CAUTION: Do not fill the reservoir beyond the upper level mark.



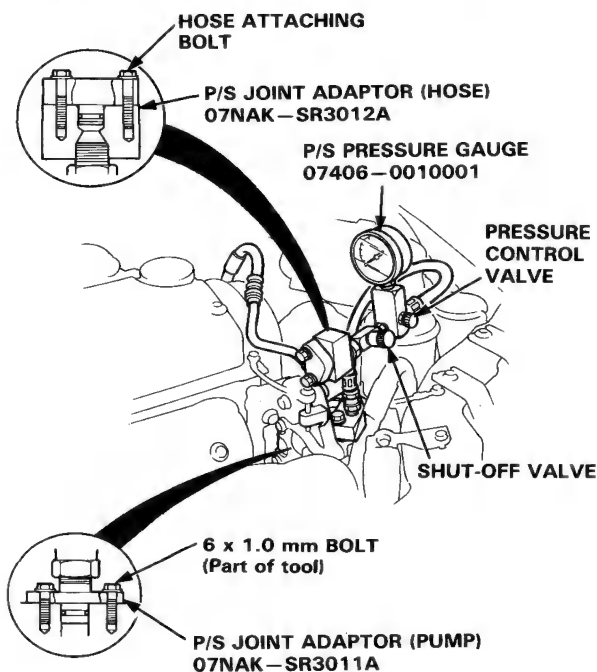
Pump Pressure Check

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

NOTE: First check the power steering fluid level and pump belt tension.

CAUTION: Disconnect the high pressure hose with care so as not to spill the power steering fluid on the frame and other parts.

1. Disconnect the outlet hose from the pump outlet fitting, and install the pump joint adaptor on the pump outlet.
2. Connect the hose joint adaptor to the power steering pressure gauge, then connect the outlet hose to the adaptor.
3. Install the power steering pressure gauge to the pump joint adaptor as shown.



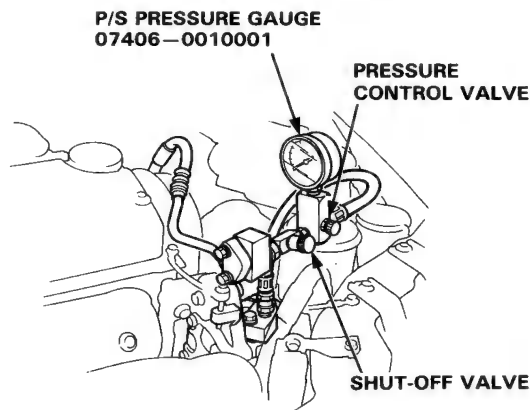
4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

6. Start the engine and let it idle.
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
8. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.
9. Immediately open the shut-off valve fully.

CAUTION: Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by over-heating.

If the pump is in good condition, the gauge should read at least. A low reading means pump output is too low for full assist. Repair or replace the pump.

LHD: 7845–8826 kpa
(80–90 kg/cm², 1138–1280 psi)
RHD: 5393–6374 kpa
(55–65 kg/cm², 782–924 psi)

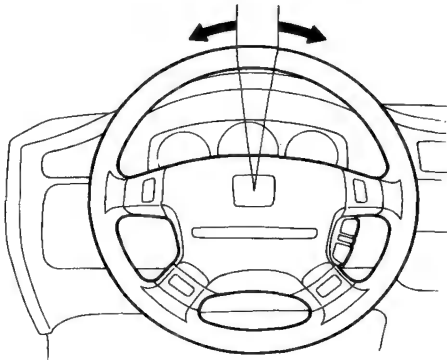


On-Car Checks

Steering Wheel Rotational Play

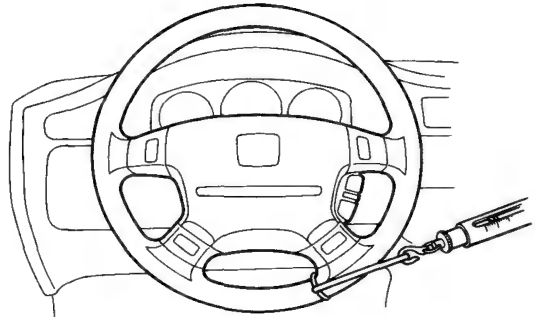
1. Place the front wheels in a straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.
2. If the play exceeds the service limit, check all steering components.

0—10 mm (0—0.4 in)



Power Assist Check with Car Parked

1. Check the power steering fluid level and pump belt tension.
2. Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



Specifications:

LHD: 30 N (3.0 kg, 6.6 lb) maximum

RHD: 25 N (2.5 kg, 5.5 lb) maximum

4. If the reading is out of specifications, check the gearbox and pump.



Steering Wheel (With SRS)

Removal

Airbag Assembly Removal

⚠ WARNING Store a removed airbag assembly with the pad surface up, if the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

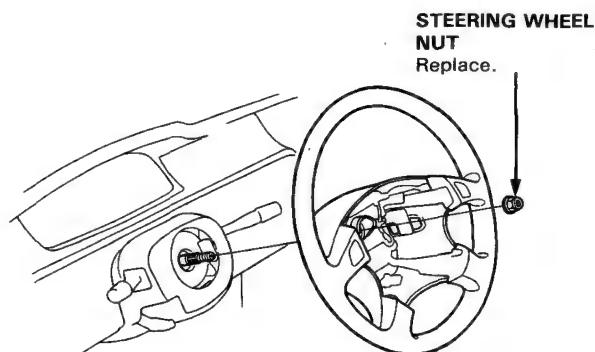
CAUTION:

- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Carefully inspect the airbag assembly before installing it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Do not disassemble or tamper with the airbag assembly.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.

NOTE:

- Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX bolt first (the safety switch will automatically turn off).
1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
 2. Remove the airbag assembly (page 23-350).

3. Remove the steering wheel nut.
4. Remove the steering wheel by locking it slightly from side-to-side as you pull steadily with both hands.



Steering Wheel (With SRS)

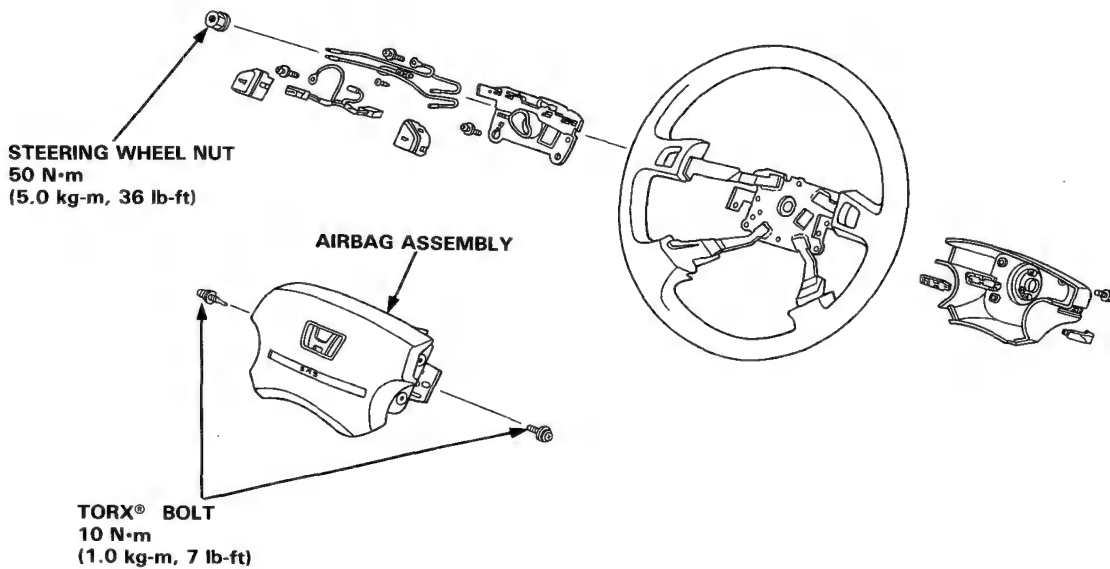
Disassembly/Reassembly

⚠ WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

NOTE: If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see page, 23-352).

CAUTION:

- **Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Do not disassemble or tamper with the airbag assembly.**

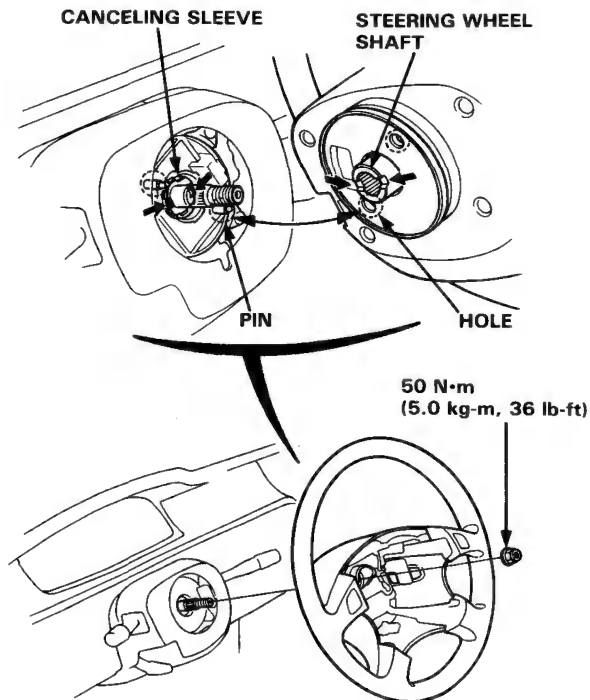




Installation

1. Install the steering wheel on the column.

NOTE: Be sure the steering wheel shaft engages the slip ring and canceling sleeve.



2. Install the airbag assembly (see page 23-351).

CAUTION:

- Be sure to install the SRS wiring so that it is not pinched or interfering with other car parts.
- Be sure the battery cables are disconnected.

3. After installing the airbag assembly, confirm proper system operation:

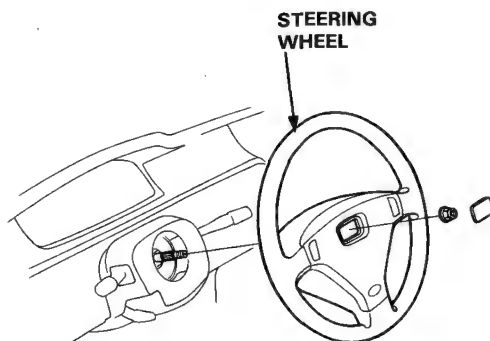
- Turn the ignition to ON: the instrument panel SRS indicator light should go on for about 6 seconds and then go off.
- The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.



Steering Wheel (Without SRS)

Removal

1. Remove the center pad.
2. Remove the steering wheel nut.
3. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.



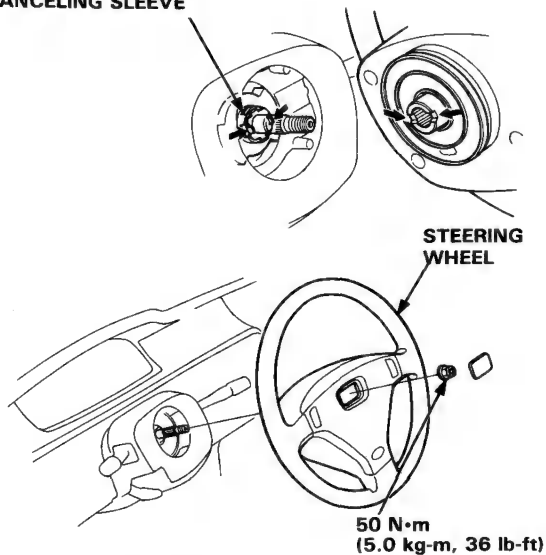
Installation

1. Install the steering wheel.

NOTE: Be sure the steering wheel shaft engages the turn signal canceling sleeve.

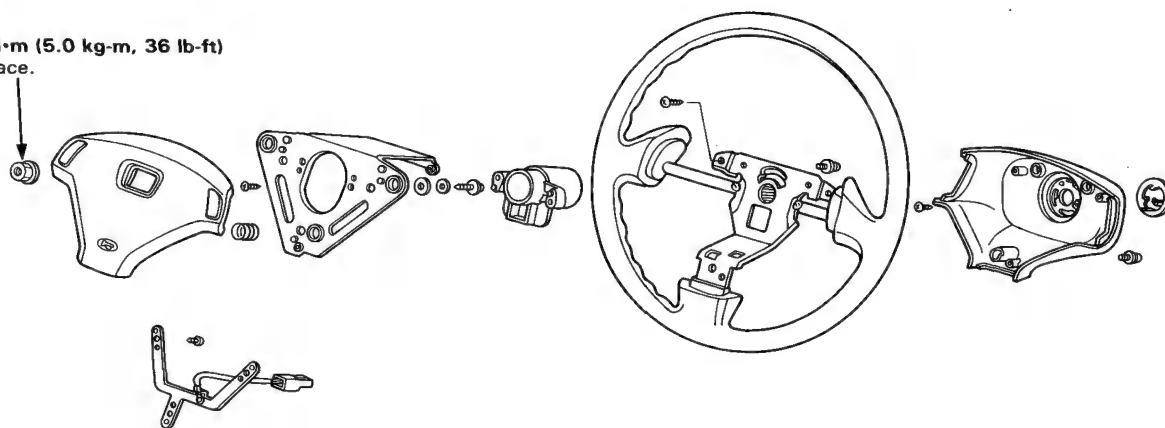
2. Install the center pad.

TURN SIGNAL
CANCELING SLEEVE



Disassembly/Reassembly

50 N·m (5.0 kg-m, 36 lb-ft)
Replace.



Steering Column

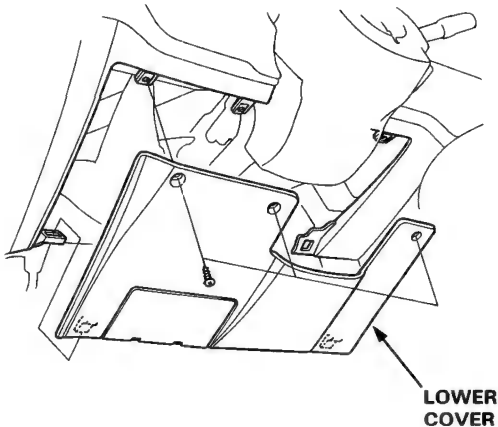
Removal

CAUTION (with SRS):

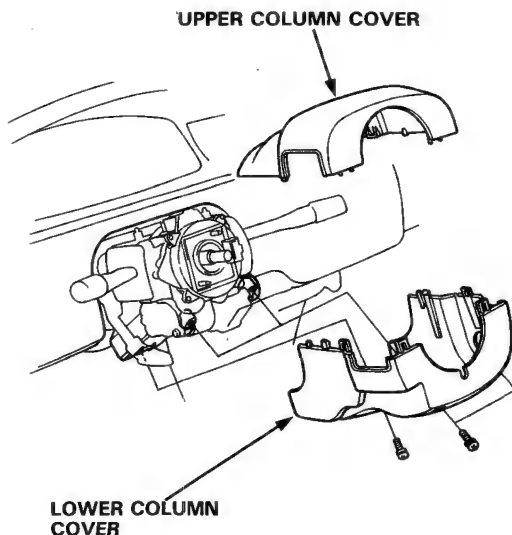
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LH drive shown. RH drive is similar.

1. Remove the steering wheel (17-65).
2. Remove the lower cover.



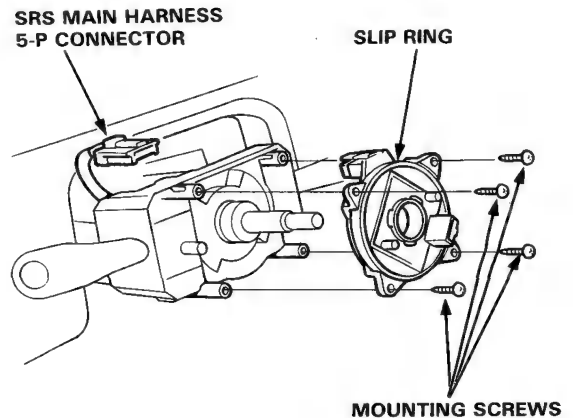
3. Remove the upper column and lower column covers.



4. Pull out the connector lock, then disconnect the SRS main harness 5-P connector from the slip ring.

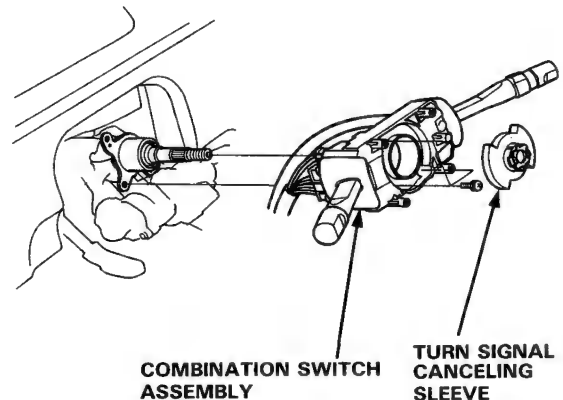
NOTE: Dispose of the connector lock, it is not to be reused.

5. Remove the slip ring from the combination switch assembly.



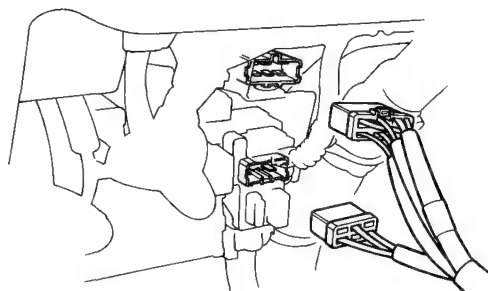
6. Remove the turn signal canceling sleeve and the combination switch assembly.

NOTE: After removing the combination switch assembly, place it on the floor gently so that it does not hinder you in service. Do not disconnect the harnesses from the combination switch assembly.

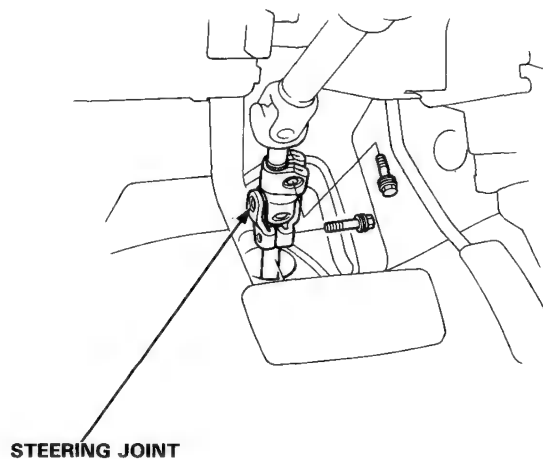




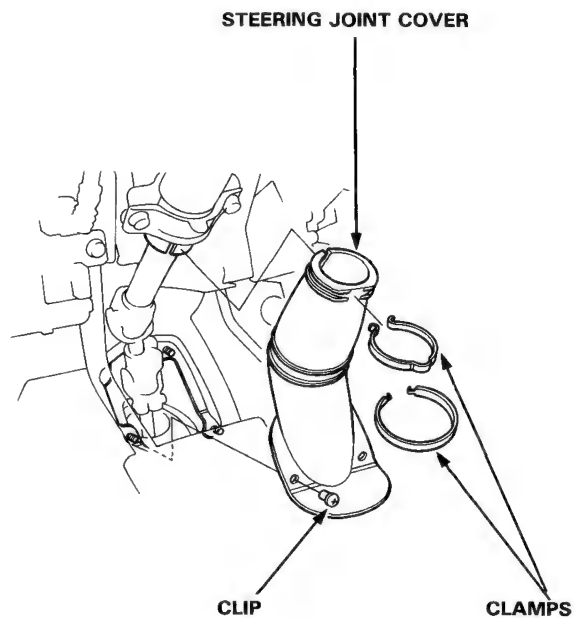
6. Disconnect the ignition switch connectors from the under-dash fuse box.



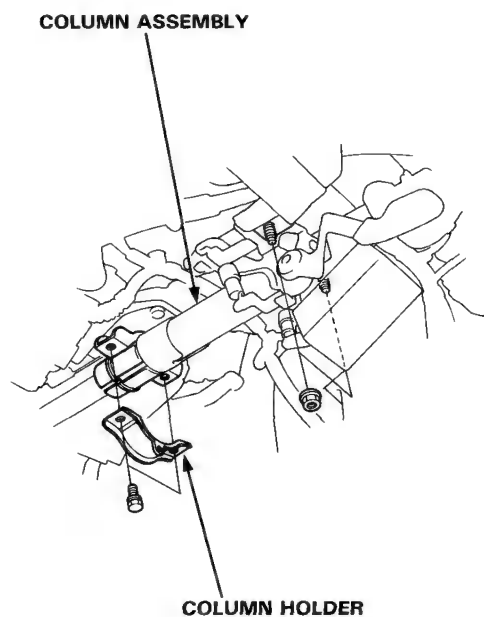
8. Remove the steering joint bolts, and move the joint toward the column.



7. Remove the steering joint cover.



9. Remove the steering column assembly by removing the attaching nuts and bolts.

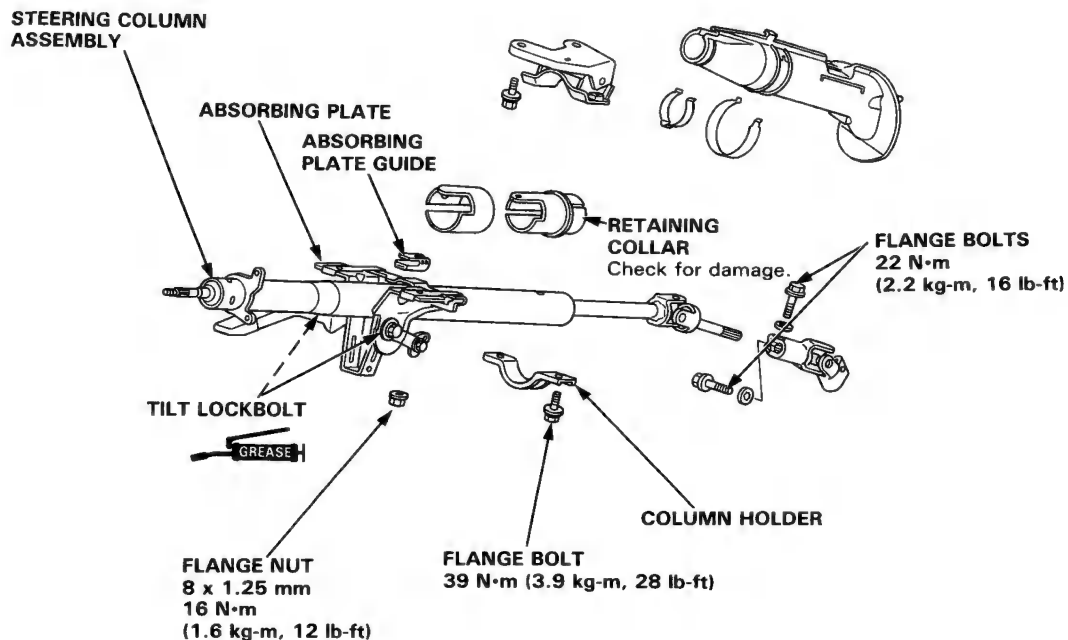


Steering Column

Inspection

NOTE:

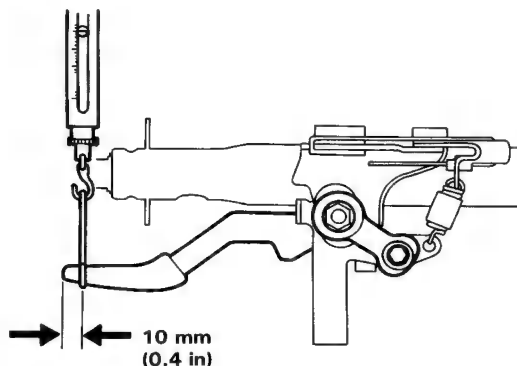
- Check the tilt mechanism, steering joint bearings and steering shaft for proper movement and damage. Replace as an assembly if damaged or faulty.
- The tilt steering column is shown; the conventional steering column is similar except for the tilt mechanism.



- Attach a spring scale to the knob of the tilt lever. Measure the force required to move the lever.

Preload: 70–90 N (7–9 kg, 15–20 lbs)

If the force measured is not within the specification, loosen the lock bolt, then the stopper, until the correct force can be obtained.



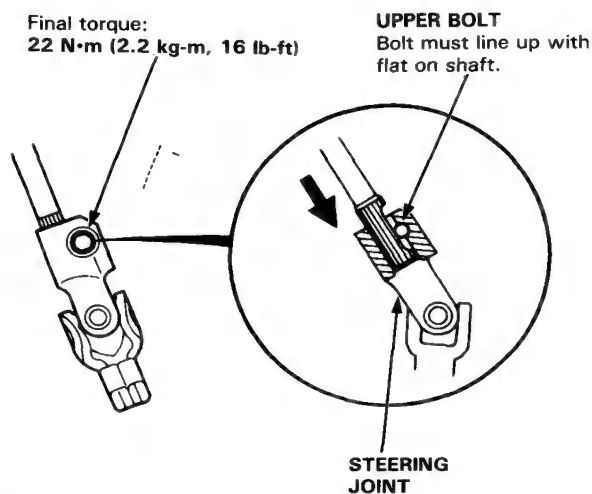


Installation

CAUTION:

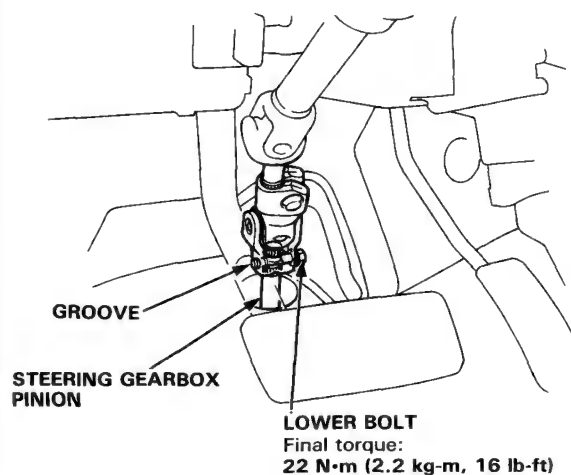
- After reassembly, confirm that the wheels are still straight ahead and that the steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary do so only by adjustment of the tie rods, not by removing and repositioning the steering wheel.

- Slip the upper end of the steering joint onto the column shaft (line up the bolt hole with the flat on the shaft) and loosely install the upper bolt.

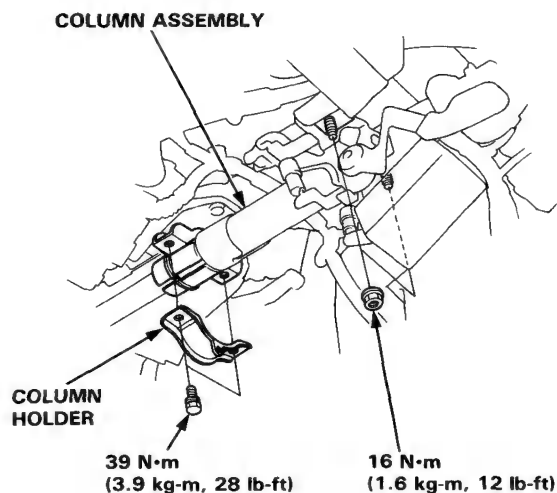


- Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and loosely install the lower bolt.

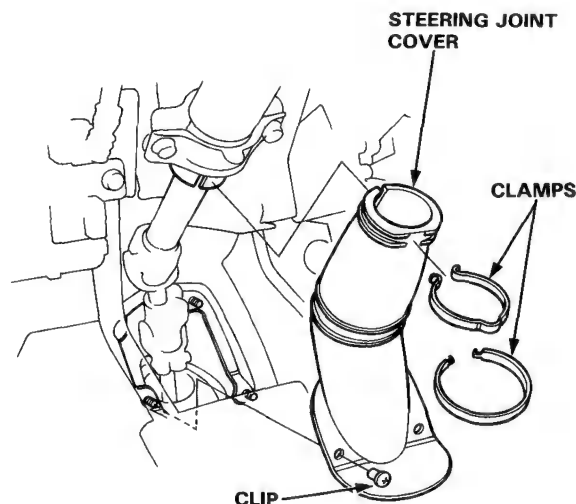
NOTE: Be sure that the lower bolt is securely in the groove in the steering gearbox pinion.



- Install the steering column assembly with the nuts and column holder.
- Tighten the upper and lower steering joint bolts loosely installed in step 2.



- Install the steering joint cover with the clamps and clip.



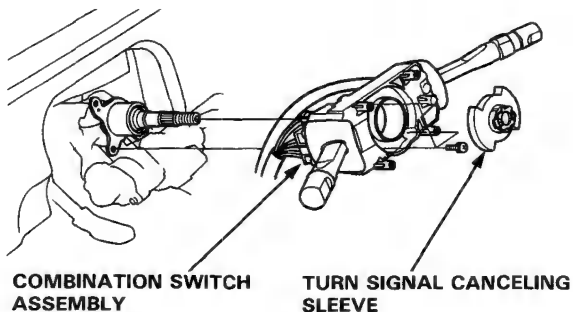
(cont'd)

Steering Column

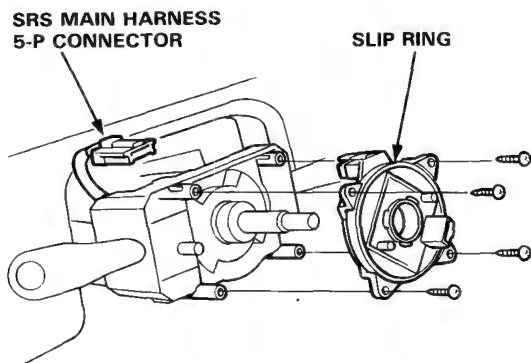
Installation (cont'd)

6. Connect the wire connectors from the ignition switch to the under-dash fuse box.
7. Install the combination switch assembly and turn signal canceling sleeve onto the steering column.

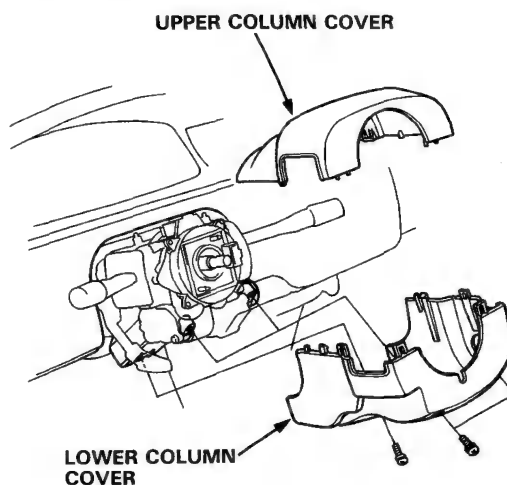
NOTE: Be sure the wires are not caught or pinched by any parts when installing the combination switch.



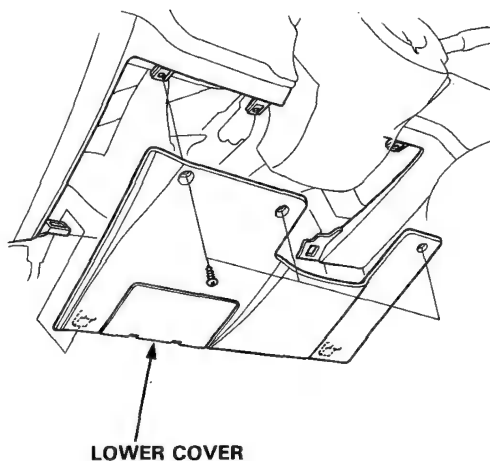
8. Install the slip ring on the steering column, then connect the SRS main harness 5-P connector to the slip ring.



9. Install the upper column cover and lower column cover.



10. Install the lower cover.



11. Install the steering wheel and airbag assembly (page 17-67).



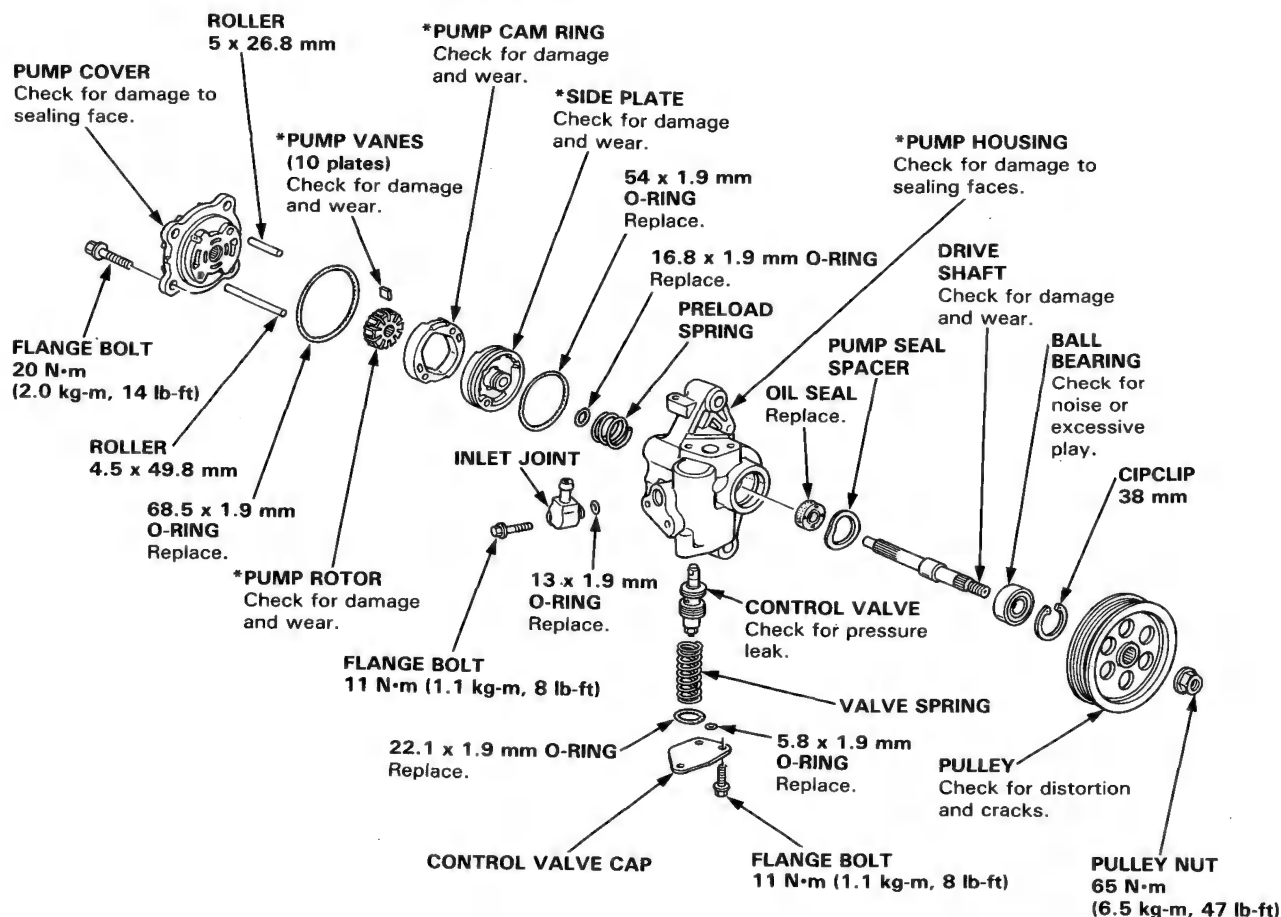
Steering Pump

Illustrated Index

CAUTION: Pump components are made of aluminum. Be careful not to damage them when servicing.

NOTE:

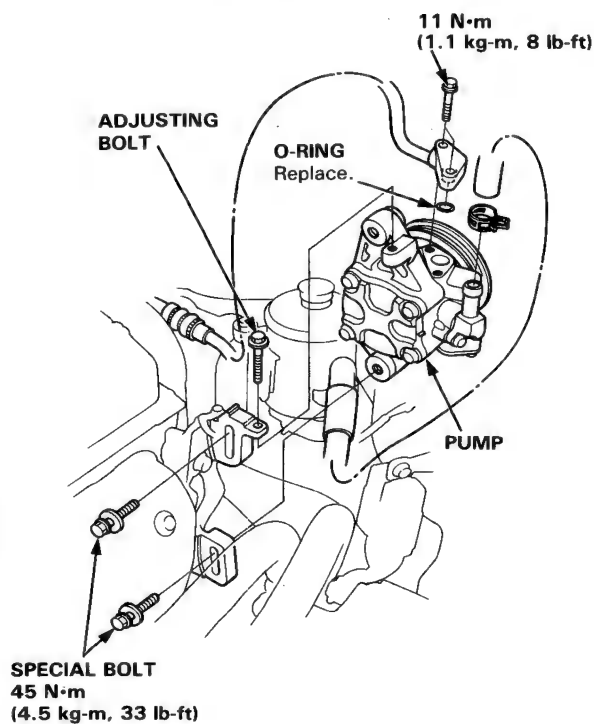
- Clean all of the disassembled parts thoroughly.
- Replace all O-rings and seals. Do not dip new O-rings and seals in solvent; coat O-rings with steering grease before installation, and make sure they stay in place during reassembly.
- If any part denoted with an asterisk is worn or damaged, replace the complete pump.



Steering Pump

Replacement

1. Drain the fluid from the system (page 17-62).
2. Disconnect the inlet and outlet hoses from the pump and plug them.
3. Remove the belt by loosening the special bolts and adjusting bolt.
4. Remove the special bolts, then remove the pump.

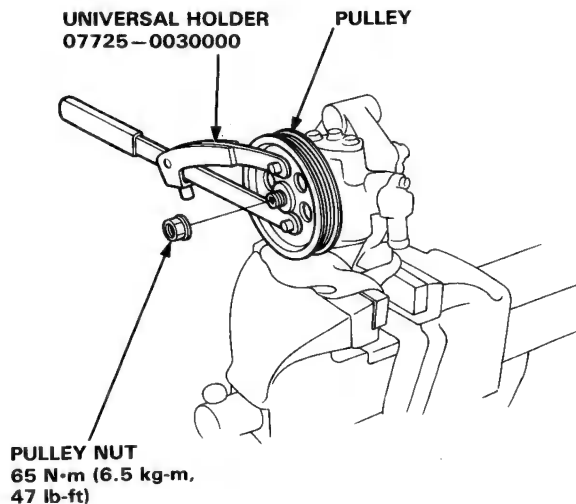


5. Loosely install a new pump on the bracket.
6. Connect the inlet and outlet hoses to the pump.
7. Install and adjust the belt (page 17-60).
8. Fill the reservoir with new fluid to the UPPER LEVEL on the reservoir.
9. Start the engine and let it run at fast idle while turning the steering wheel lock-to-lock several times to bleed air from the system.
10. Check the reservoir and add fluid if necessary.

Pulley Replacement

Hold the steering pump in a vise with soft jaws, and hold the pulley with the special tool and remove the pulley nut and pulley.

NOTE: Pulley nut has left-hand threads.

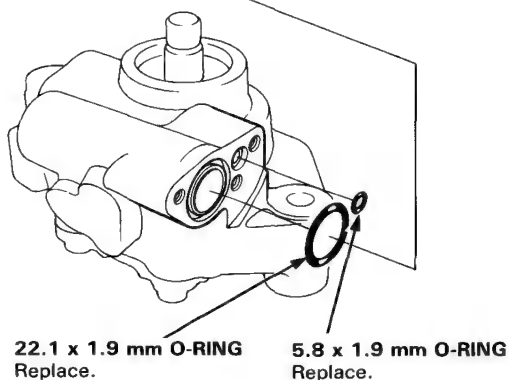
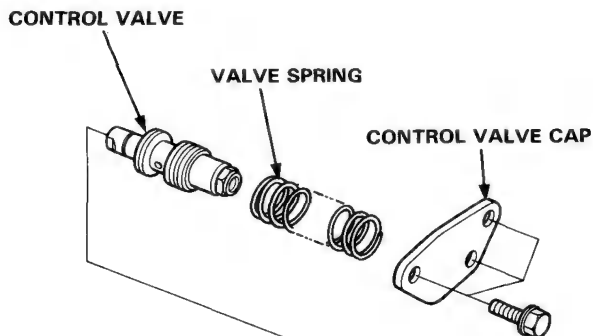


Hold the pulley with the special tool and tighten the pulley nut.

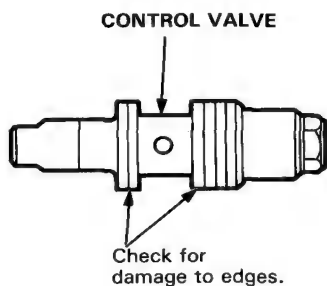


Control Valve Inspection and Replacement

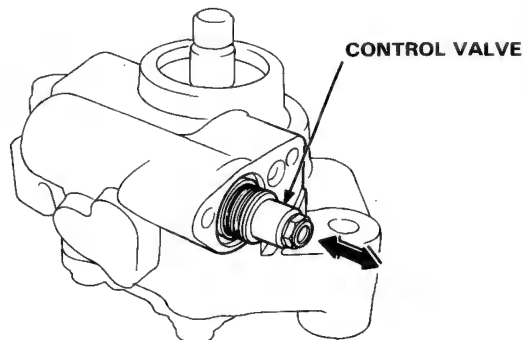
1. Remove the control valve cap by removing the three flange bolts.
2. Remove the control valve spring, control valve and O-rings.



3. Check for wear, burrs, and other damage to the edges of the grooves in the valve.

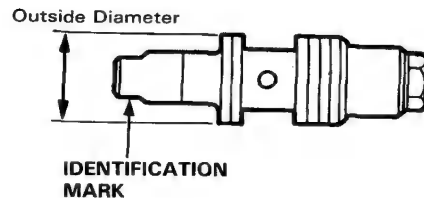


4. Slip the valve back in the pump and check that it moves in and out smoothly.



If OK, go on step 5, if not replace the valve:

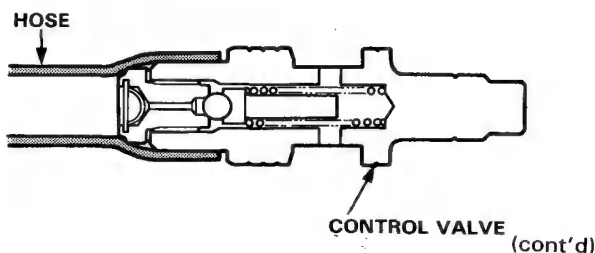
NOTE: The original valve was selected for a precise fit in the pump housing bore, so make sure the new one has the same identification mark.



Mark	Part Name	Outside Diameter mm (in)
A	CONTROL VALVE A	17.991–17.996 (0.7083–0.7085)
B	CONTROL VALVE B	17.996–18.001 (0.7085–0.7087)

If OK, go on step 5, if not, replace the whole pump as an assembly.

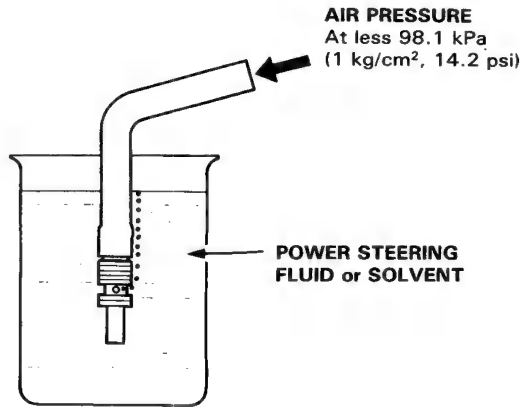
5. Attach a hose to the end of the valve as shown.



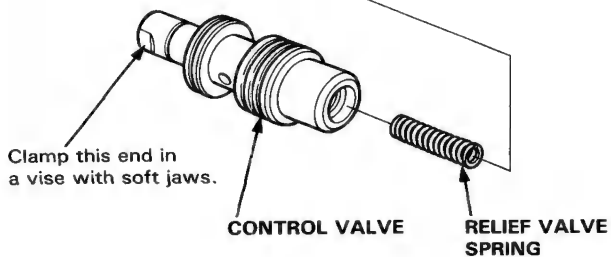
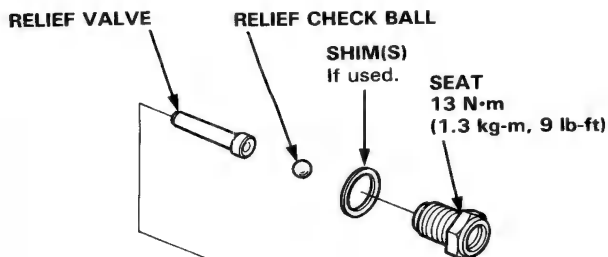
Steering Pump

Control Valve Inspection and Replacement (cont'd)

6. Submerge the valve in a container of power steering fluid or solvent, and blow in the hose. If air bubbles leak through the valve, replace or repair it as follows.



7. Clamp the bottom end of the valve in a vise with soft jaws.
8. Unscrew the seat in the top end of the valve, and remove any shims, the relief check ball, relief valve and relief valve spring.

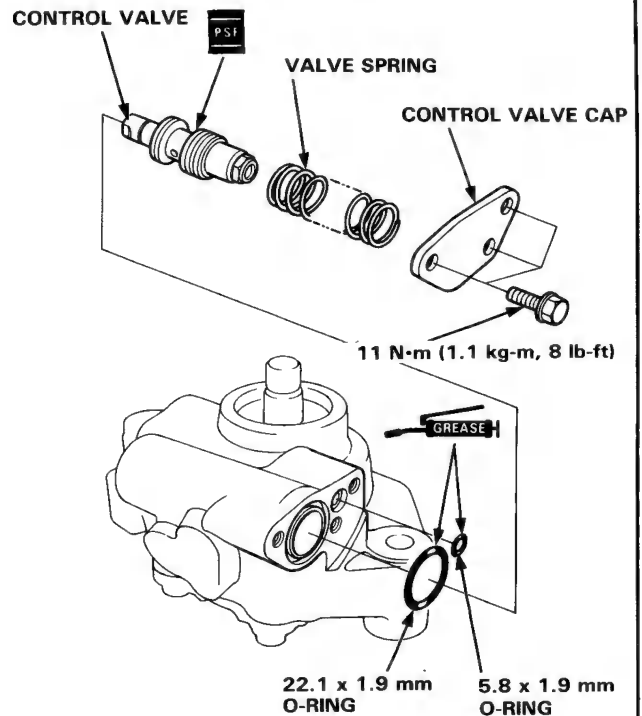


9. Clean all the parts in solvent, dry them off then reassemble and retest the valve.

NOTE: If necessary, relief pressure is adjusted at the factory by adding shims under the check ball seat. If you found shims in your valve, be sure you reinstall as many as you took out.

10. Install the control valve in the reverse order of removal.

- Apply steering grease (Honda P/N 08733-B070E) to new O-rings.
- Coat the control valve with power steering fluid, then install it and valve spring.

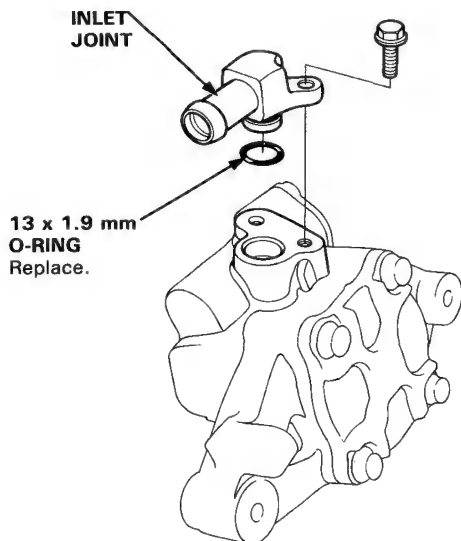




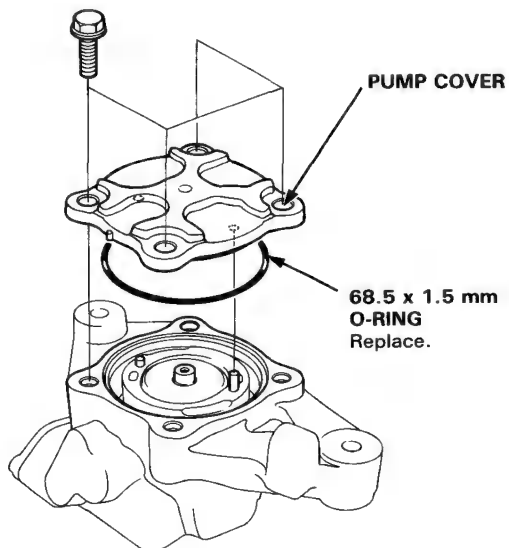
Pump Disassembly

CAUTION: The pump components are made of aluminum. Be careful not to damage them when servicing.

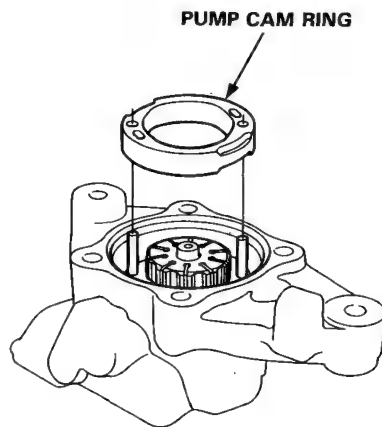
1. Remove the pump from the engine (page 17-76).
2. Remove the pulley (page 17-76).
3. Remove the control valve (page 17-77).
4. Remove the inlet joint and O-ring.



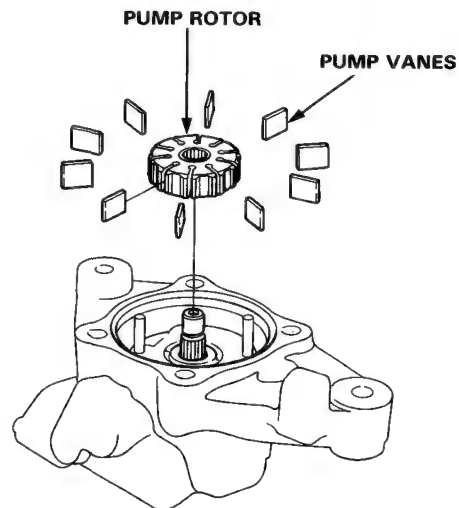
5. Remove the pump cover and O-ring.



6. Remove the pump cam ring from the pump housing.



7. Remove the pump rotor and vanes.

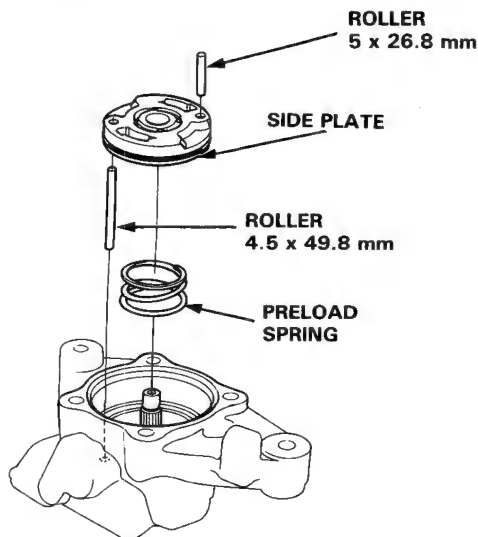


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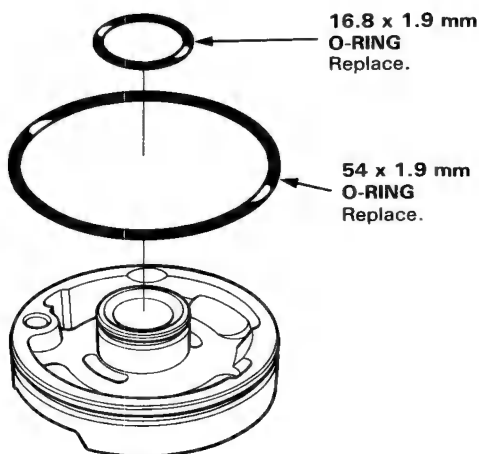
Steering Pump

Pump Disassembly (cont'd)

8. Remove the two rollers from the side plate.
9. Remove the side plate and preload spring.

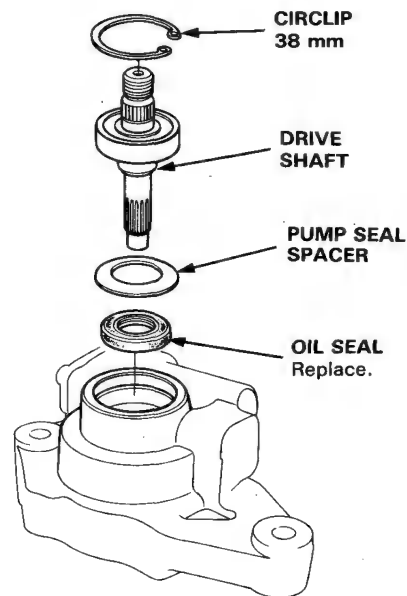


10. Remove the O-rings from the side plate.



11. Remove the circlip, then remove the drive shaft assembly from the pump housing using a plastic hammer.

12. Remove the seal spacer and oil seal.



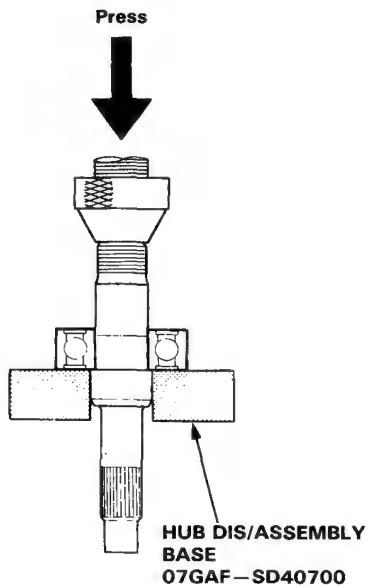
13. Check the pump ball bearing for play; if it is good and the grease in it is clean, go on step 14.

— If the bearing is noisy or has excessive play, replace the bearing.

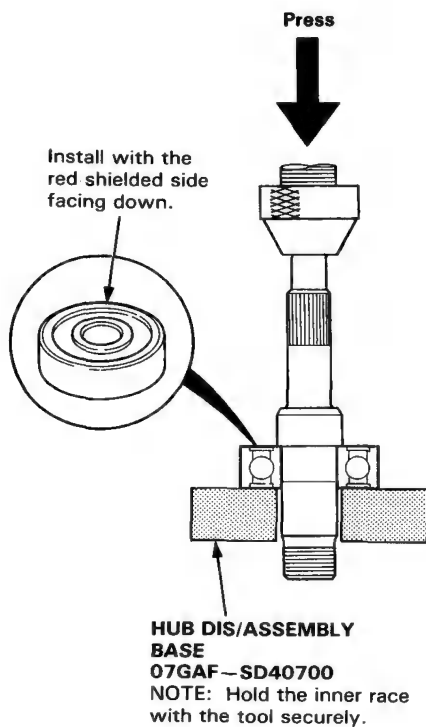




- Remove the bearing using the special tool and press.



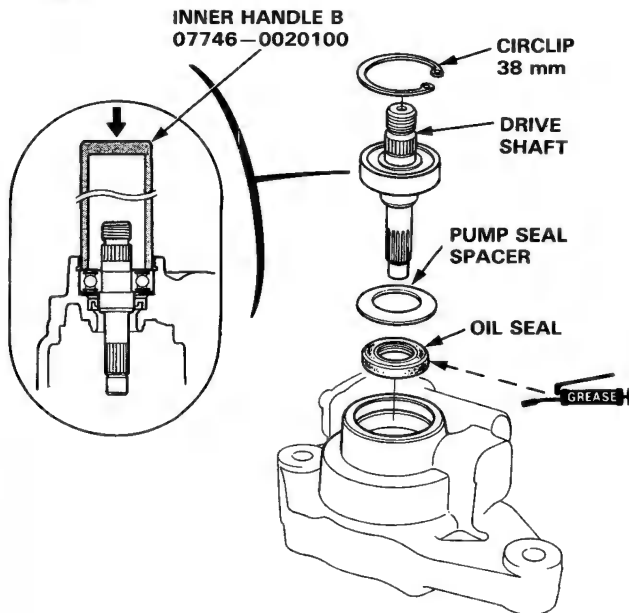
- Install the new bearing using the press and special tool.



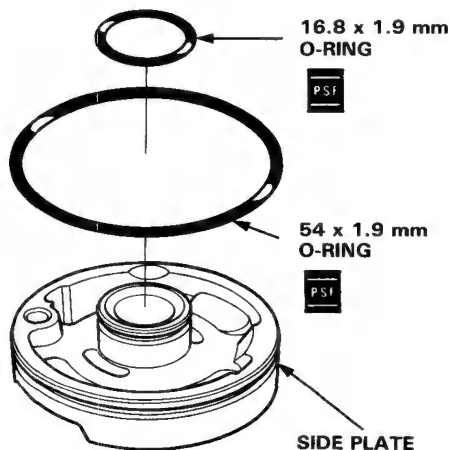
Steering Pump

Pump Assembly

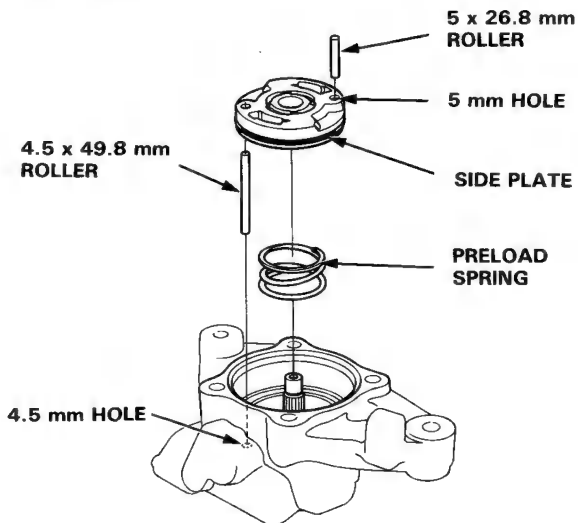
1. Coat the lip of the new oil seal with steering grease (Honda P/N 08733-B070E).
2. Install the new oil seal in the pump housing by hand, then install the pump seal spacer.
3. Install the pump driver shaft assembly with the special tool.
4. Install the 38 mm circlip with its tapered side facing out.



5. Coat the side plate grooves with power steering fluid, then position the 16.8 x 1.9 mm and 54 x 1.9 mm O-rings on the side plate.

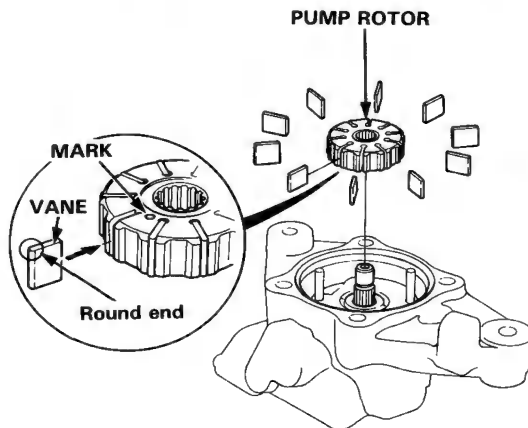


6. Install the preload spring in the pump housing.
7. Set the 4.5 x 49.8 mm roller in the 4.5 mm hole in the pump housing.
8. Set the side plate over the roller and install it on the pump housing.
9. Set the 5 x 26.8 mm roller in the 5 mm hole in the side plate.



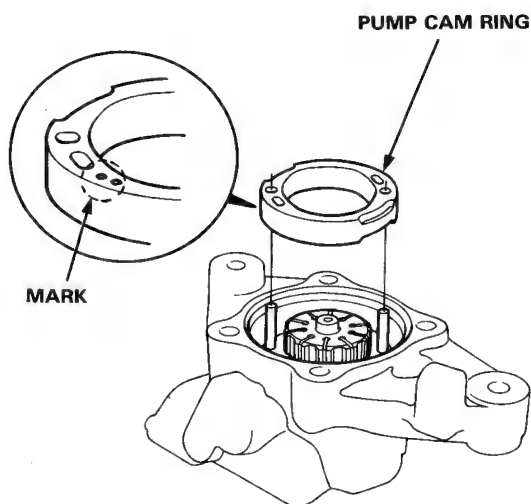
10. Assemble pump rotor to the drive shaft with the "o" mark on the rotor facing upward.
11. Set the 10 vanes in the grooves in the rotor.

NOTE: Be sure that the round end of the vanes is in contact with the sliding surface of the cam ring.





12. Set the pump cam ring over the two rollers with the "ø" mark on the cam ring upward.

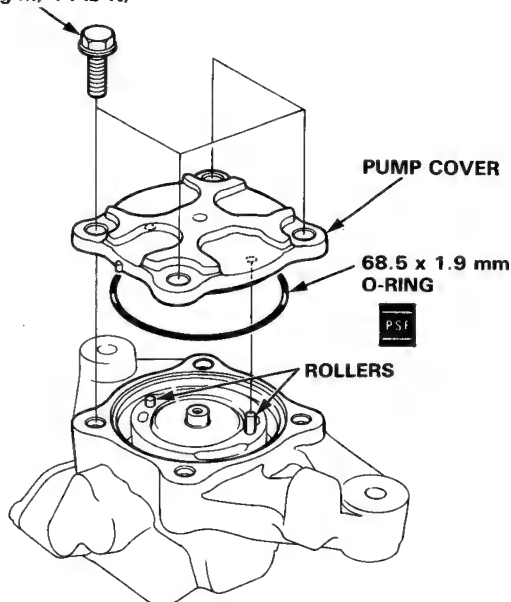


13. Install the 68.5 x 1.9 mm O-ring on the pump cover.

14. Align the roller set holes in the pump cover with the rollers.

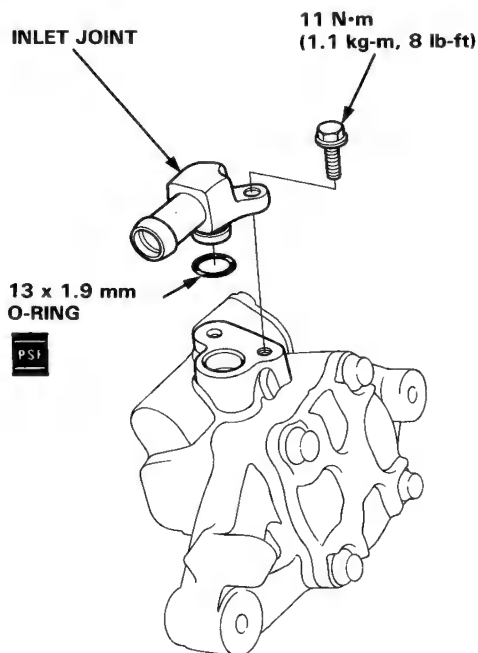
15. Align the projection on the pump housing and the projection on the pump cover and tighten the four bolts.

20 N·m
(2.0 kg-m, 14 lb-ft)



16. Set the 13 x 1.9 mm O-ring on the inlet joint.

17. Install the inlet joint on the pump housing.



18. Install the control valve (page 17-78).

19. Install the pulley (page 17-76) and check that the pump turns smoothly by turning the pulley.

(cont'd)


Steering Gearbox (LHD)

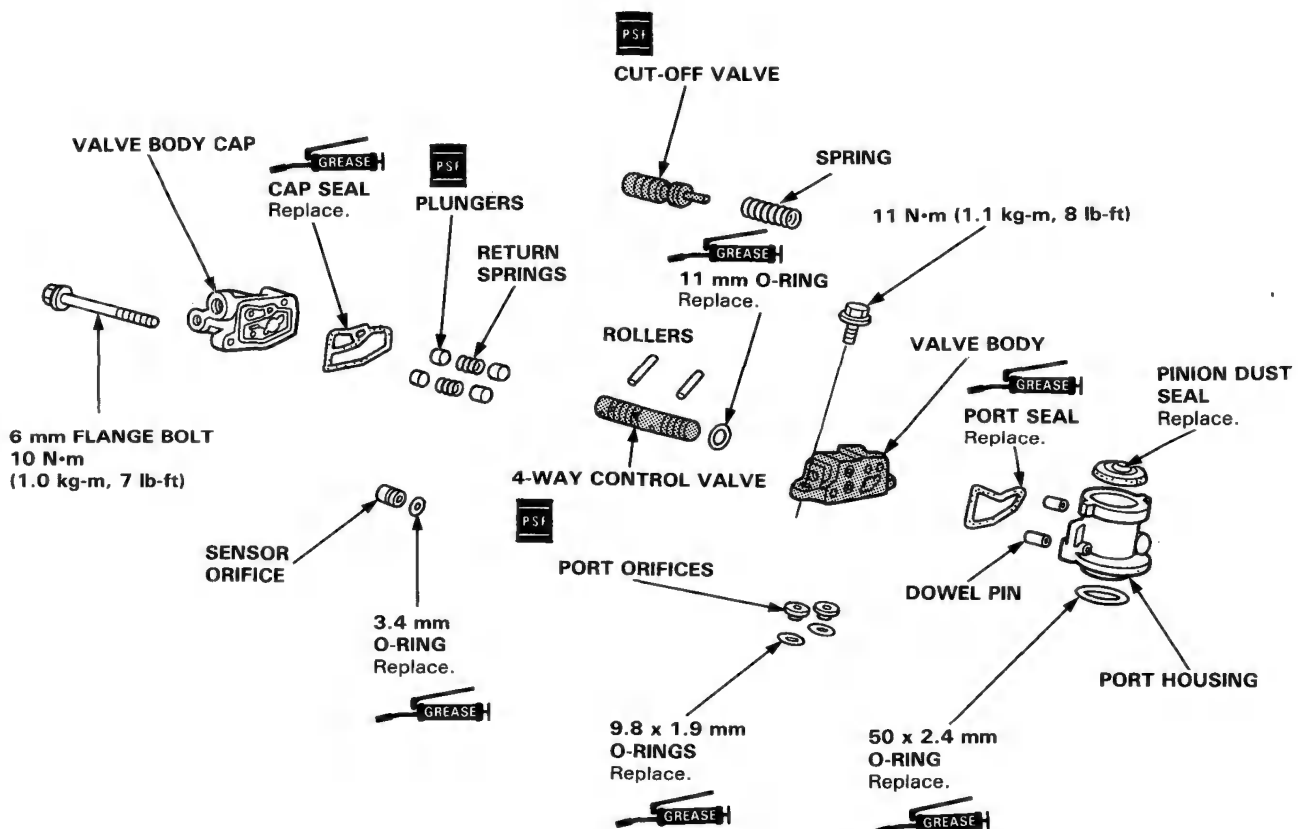
Valve Body Unit Overhaul

NOTE: If the Valve Body is damaged, it must be replaced as a set, with the Cut-off Valve and 4-Way Control Valve (shaded parts).

CAUTION:

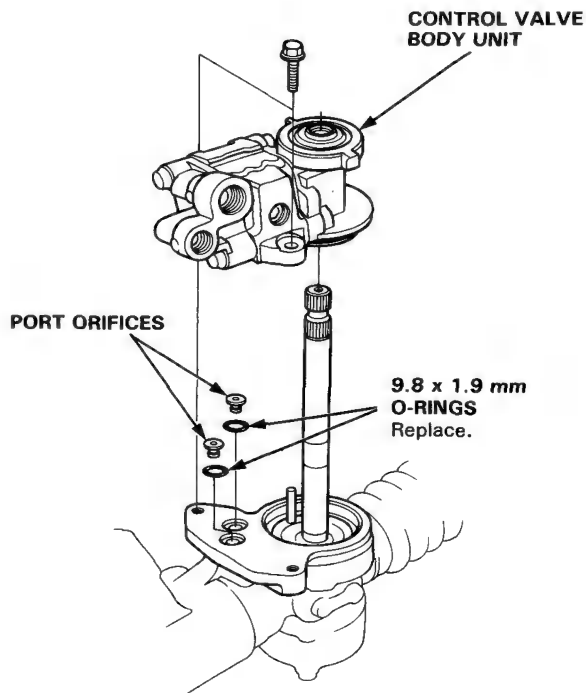
- Replace the O-rings and seals with new ones.
- Do not dip the O-rings and seals in solvent.
- Apply grease in the seal grooves to keep the cap and port seals in place.
- Apply grease to the 50 x 2.4 mm and 11 mm O-rings to keep them in place in the valve ports.

-  STEERING GREASE Part Number 08733-B070E

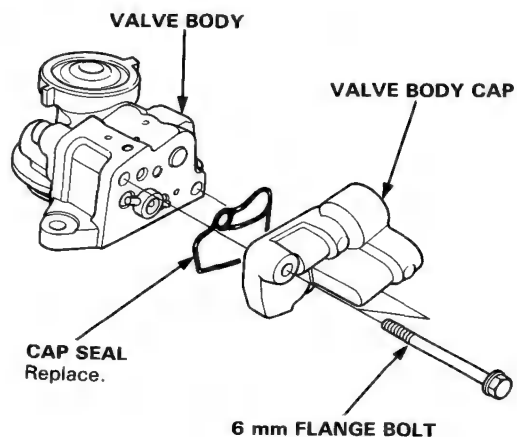




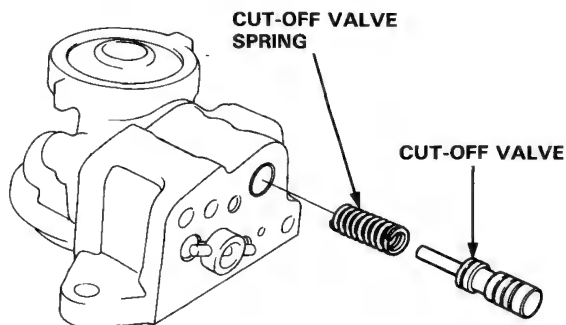
1. Remove the steering gearbox (17-89).
2. Remove the two 8 mm flange bolts and remove the control valve body unit from the gearbox.
3. Remove the O-rings and port orifices from the gearbox.



4. Remove the two 6 mm flange bolts, then remove the cap from the valve body.
5. Remove the cap seal from the cap.

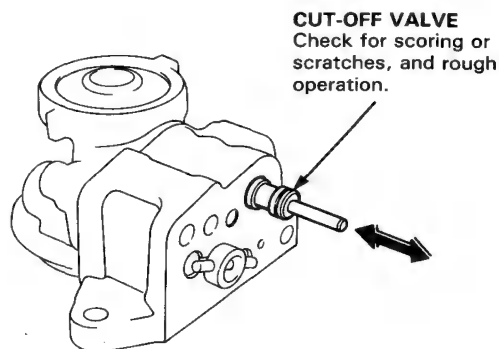


6. Remove the cut-off valve and spring from the valve body.



7. Check the cut-off valve:

- Inspect its surface for scoring or scratches.
- Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.



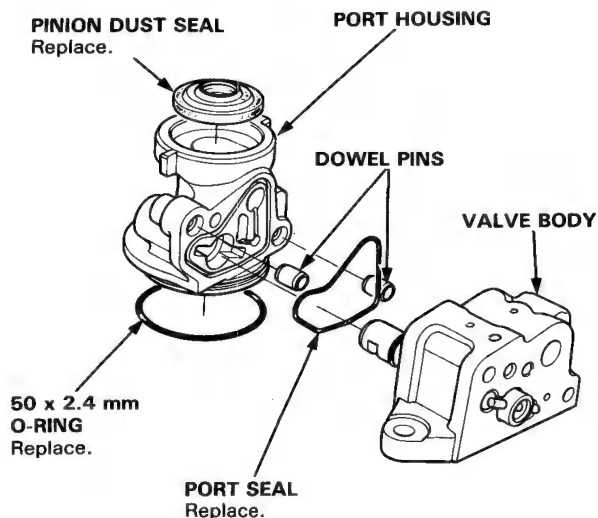
NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, 4-way control valve) as an assembly.

(cont'd)

Steering Gearbox (LHD)

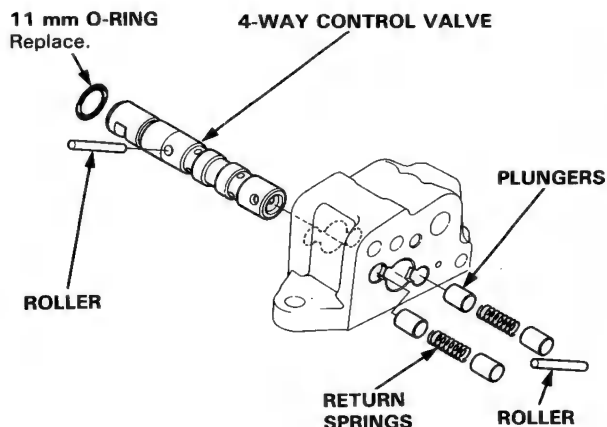
Valve Body Unit Overhaul (cont'd)

8. Separate the valve body and port housing.
9. Remove the seal and dowel pins from the port housing.
10. Remove the pinion dust seal and O-ring from the port housing.



11. Remove the rollers from the control valve by pushing the valve out one side of the valve body, and then the other.

NOTE: When removing the rollers, hold the plungers with your fingers to keep them from popping out.



12. Remove the plungers, return springs and 4-way control valve from the valve body.
13. Remove the 11 mm O-ring from the 4-way control valve.

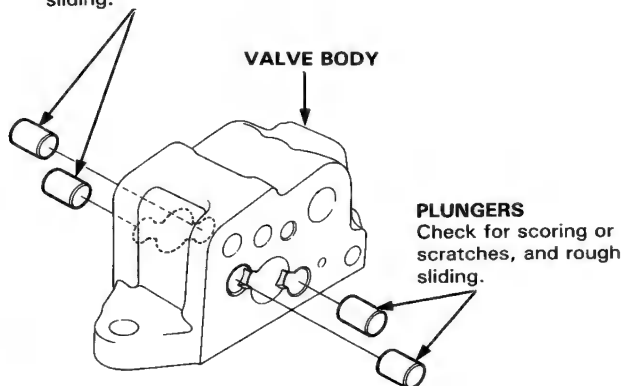
14. Check the plungers.

- Inspect their surface for scoring or scratches.
- Slip each plunger into the valve body, and make sure it slides smoothly, without drag or side play.
If any plunger is damaged, replace it.

NOTE: If the valve body is damaged, replace all three parts (valve body, cut-off valve and 4-way control valve) as a set.

PLUNGERS

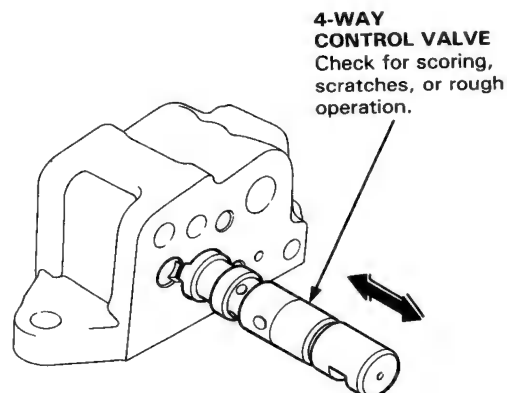
Check for scoring or scratches, and rough sliding.

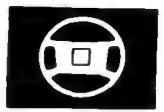


15. Check the 4-way control valve.

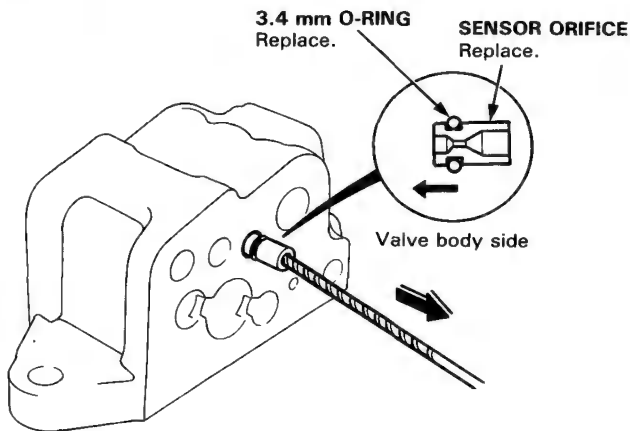
- Inspect its surface for scoring or scratches.
- Slip it into the valve body, and make sure it slides smoothly, without drag or side play.

NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, cut-off valve, 4-way control valve) as an assembly.





16. If necessary; replace the sensor orifice and O-ring using a 1.5 mm (1/16") drill bit.



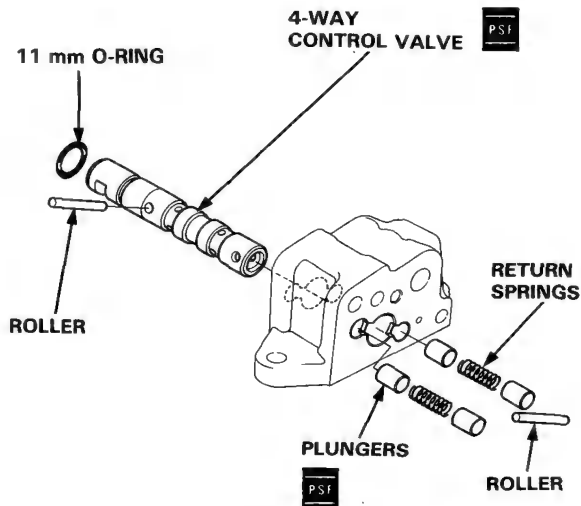
- Coat the new O-ring with the power steering fluid-V and install the sensor orifice into the valve body by tapping lightly with a rubber mallet.

Assembly:

NOTE:

- Thoroughly clean all the disassembled parts.
- Coat the plungers, cut-off valve and 4-way control valve surfaces with power steering fluid-V.

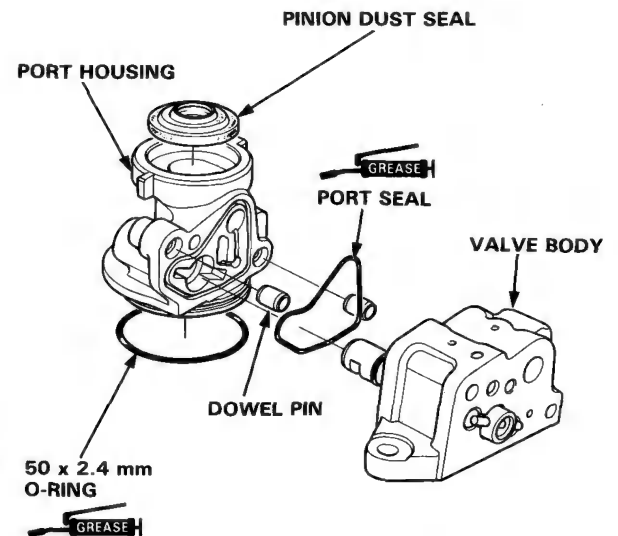
17. Coat the O-ring with grease, and install it on the 4-way control valve.
18. Install the 4-way control valve, plungers, return springs and rollers into the valve body.



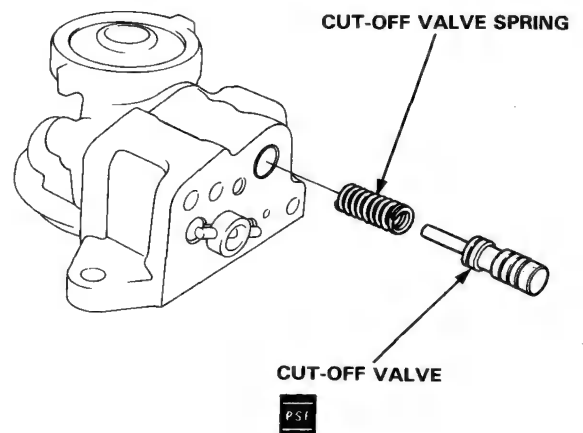
19. Install the new pinion dust seal in the control valve body unit by hand.

20. Coat the O-ring and port seal with grease, and install them port housing.

21. Install the dowel pins and valve body on the port housing.



22. Install the cut-off valve spring and cut-off valve.

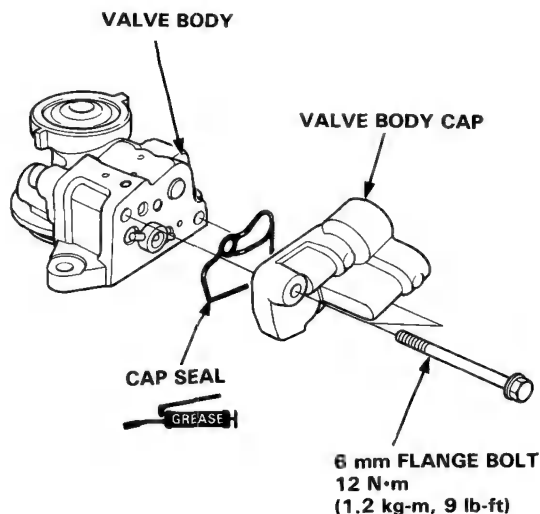


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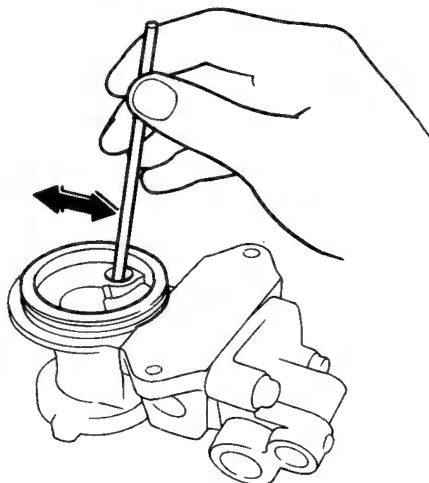
Steering Gearbox (LHD)

Valve Body Unit Overhaul (cont'd)

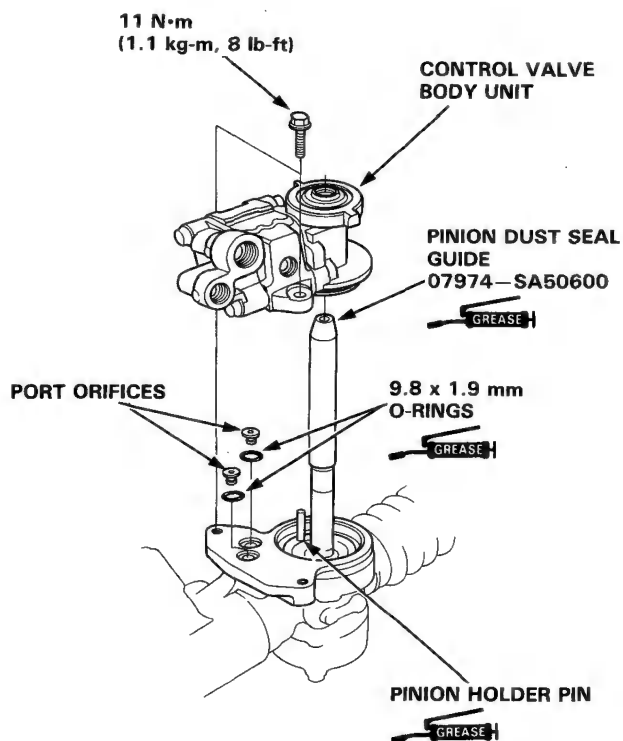
23. Coat the cap seal with grease and install the valve body cap.
24. Install and tighten the 6 mm flange bolts in the control valve body unit.



25. Make sure the control valve moves smoothly, and returns to neutral position.



26. Coat the 9.8 x 1.9 mm O-rings and pinion holder pin with grease, and install them together with the orifices.
27. Apply grease to the surface of the special tool and install it on the pinion shaft.
28. Install the valve body unit on the gear housing with the two 8 mm bolts.



29. Remove the special tool.

CAUTION:

- When installing, be careful not to hit the pinion holder pin.
- Make sure the O-rings are in place and not pinched.

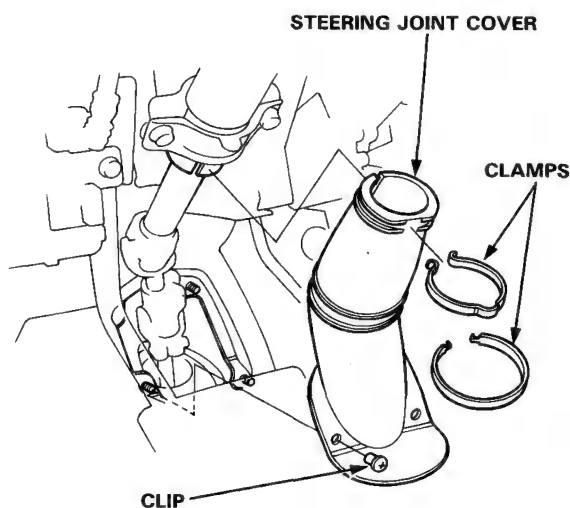


Gearbox Removal

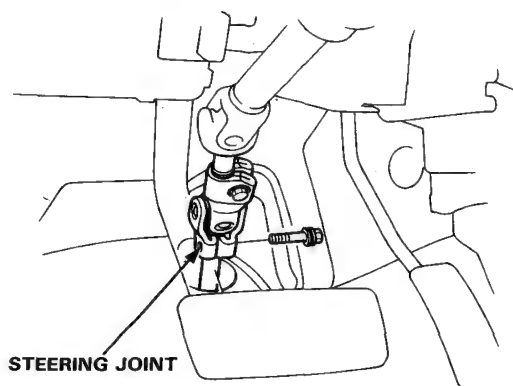
NOTE:

- Before removing the steering gearbox, align the front wheels straight ahead.
- Disconnect the battery negative terminal and then disconnect the positive terminal.

1. Drain the power steering fluid as described on page 17-43.
2. Remove the steering joint cover.



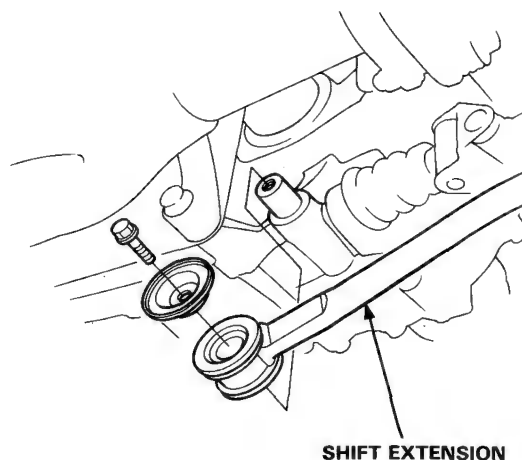
3. Remove the steering joint lower bolt, and move the joint toward the column.
4. Raise the front of car and support on safety stands in the proper locations.
5. Remove the front wheels.



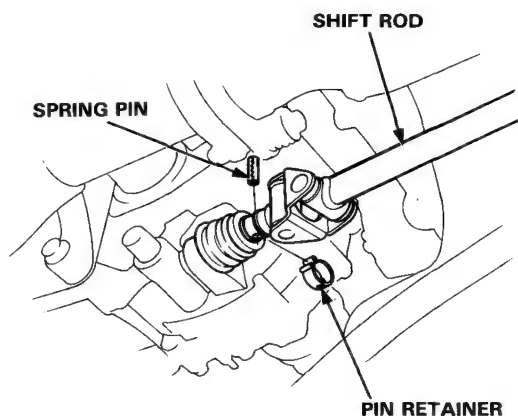
6. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and the end of the gearbox. Blow dry with compressed air.

(Manual transmission model only)

- Remove the shift extension from the transmission case.



- Slide the boot back at the connecting position of the gear shift rod.
- Drive out the spring pin with a punch, then disconnect the shift rod.



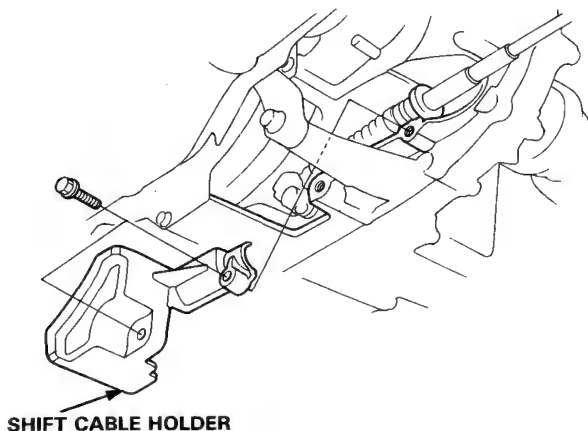
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Steering Gearbox (LHD)

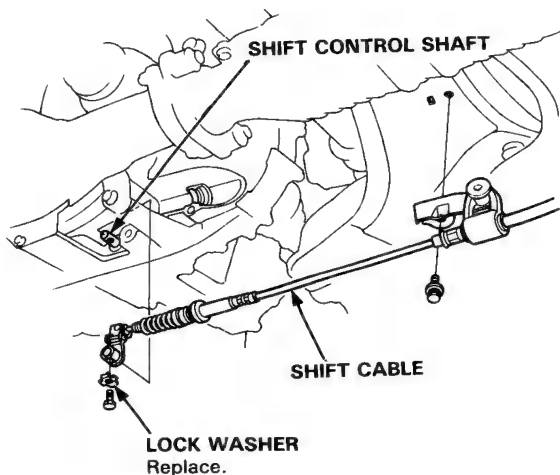
Gearbox Removal (cont'd)

(Automatic transmission only)

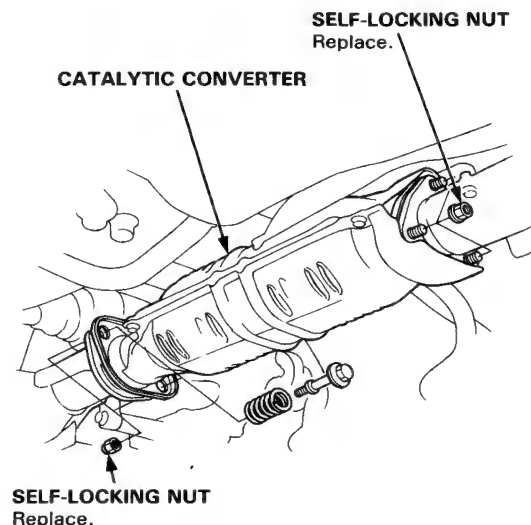
- Remove the shift cable holder



- Disconnect the shift cable from the shift control shaft.



7. Separate the catalytic converter by removing the self-locking nuts.

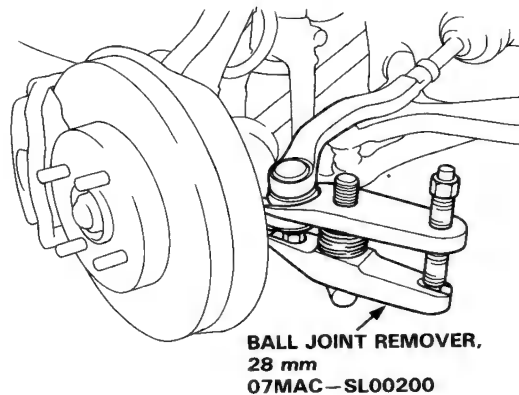


8. Remove the cotter pin from the tie-rod ball joint nut and remove the nut.
9. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Remove the ball joint using the Ball Joint Remover, 28 mm (07MAC—SL00200). Refer to page 18-12 for how to use the ball joint remover.

10. Separate the tie-rod ball joint and knuckle using the special tool.

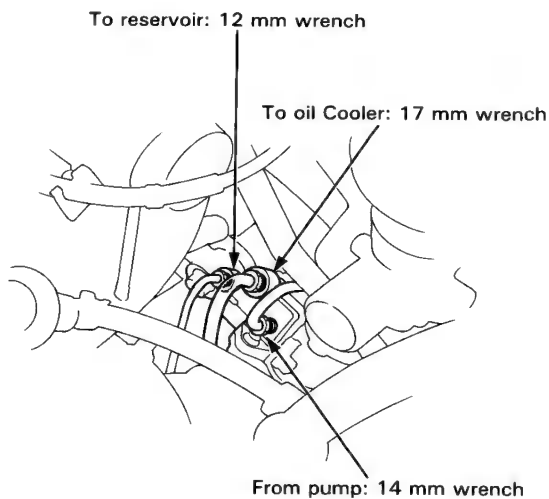
CAUTION: Avoid damaging the ball joint boot.





11. Disconnect the three lines from the control unit.

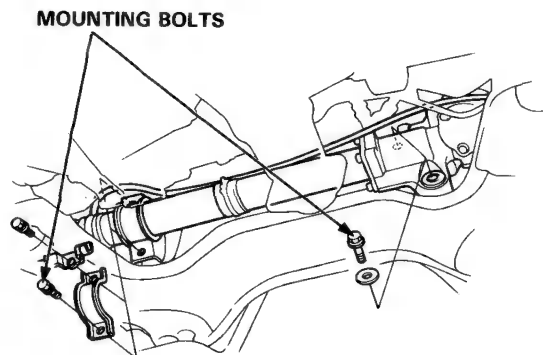
CAUTION: After disconnecting the hoses and pipes, plug or seal the hoses and pipes with the piece of tape or equivalent to prevent foreign materials from entering the control unit.



12. Remove the left tie-rod end, then slide the rack all the way to the right.

NOTE: Remove the performance rod, if it is equipped.

13. Remove the steering gearbox assembly mounting bolts and pinion shaft gromet.

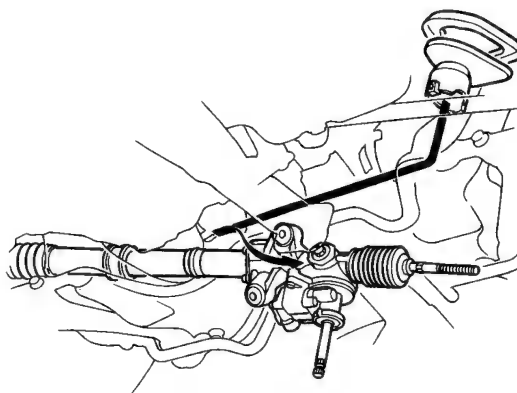


14. Pull the steering gearbox assembly all the way down to clear the pinion shaft from the blukhead.

15. Move the steering gearbox assembly to the right so the left rack end clears the rear beam.

16. Hold the steering gearbox assembly and slide the rack all the way to the left, place the left rack end below the rear beam.

17. Move the steering gearbox assembly to the left and tilt the left side down to remove it from the car.



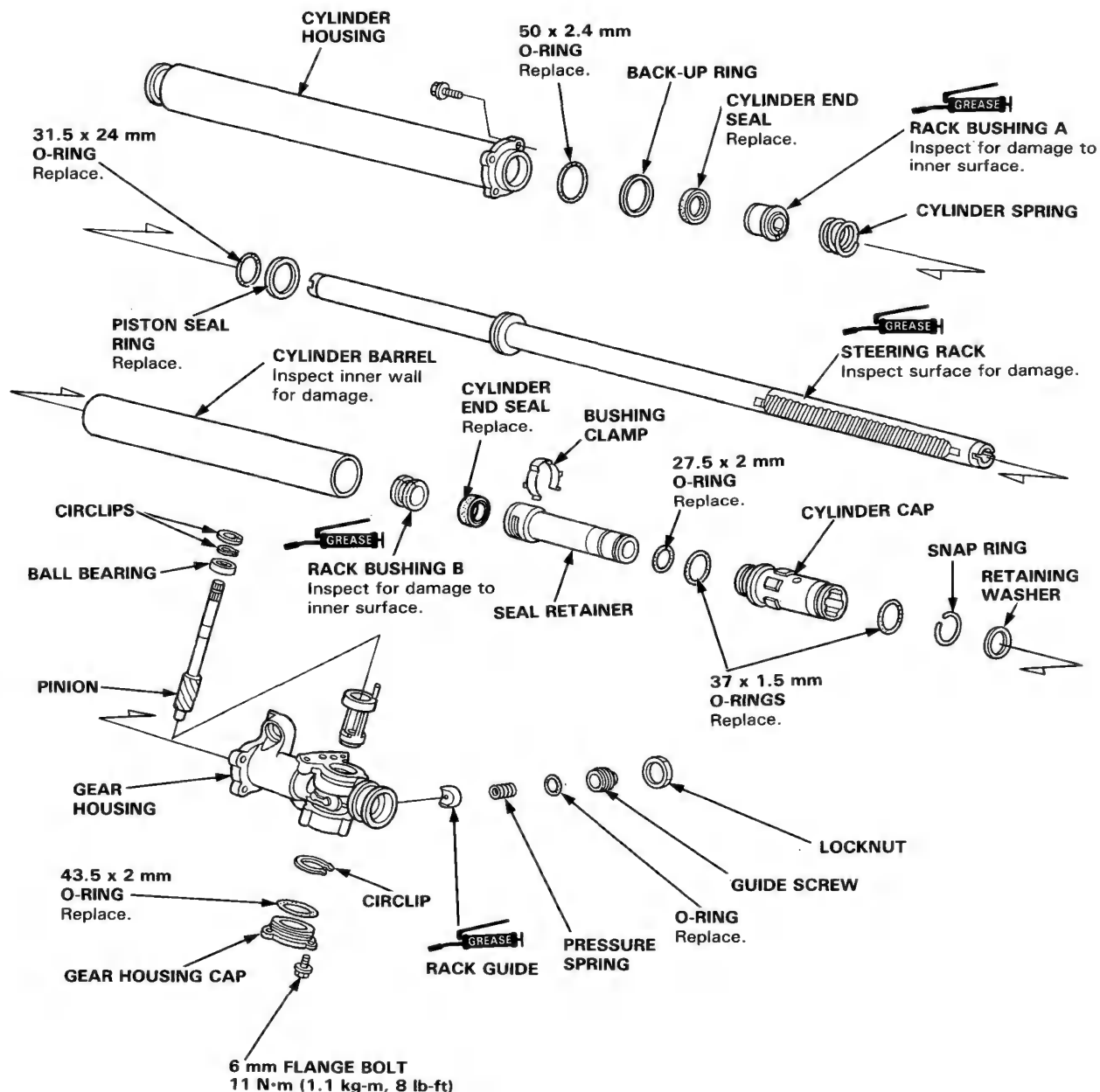
Steering Gearbox (LHD)

Illustrated Index

CAUTION:

- Before disassembling the gearbox, wash it off with solvent and a brush.
- Thoroughly clean all disassembled parts.
- Always replace O-rings and seals.
- Replace parts with damaged sliding surfaces.
- Do not dip seals and O-rings in solvent; coat O-rings with grease, make sure they stay in position during reassembly, and use appropriate special tools to install them where necessary.

-  **STEERING GREASE** Part Number 08733-B070E

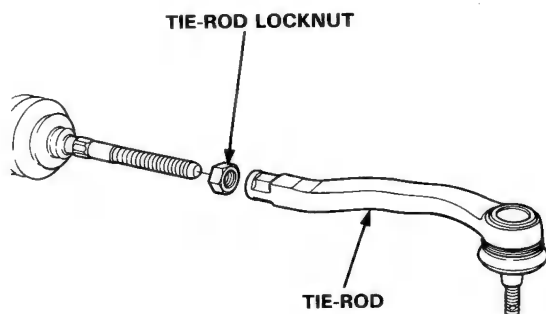




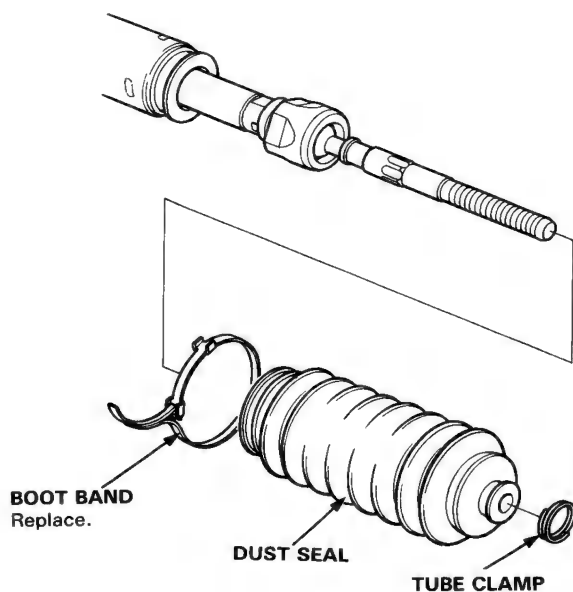
Overhaul

Disassembly

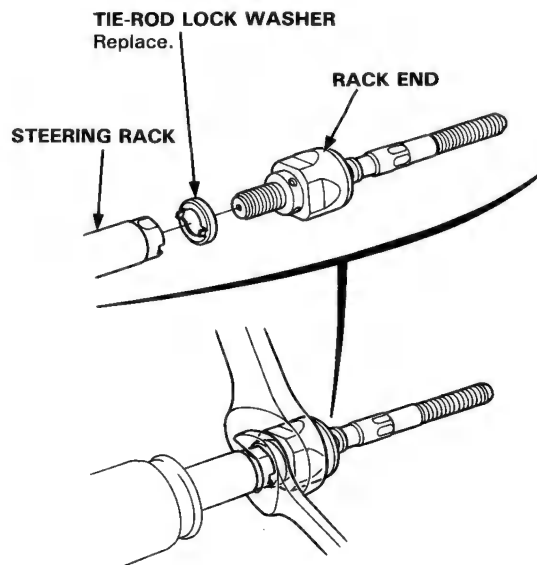
1. Remove the control valve unit as described on page 17-84.
2. Carefully clamp the gearbox in a vise with soft jaws.
3. Remove the tie-rod assembly.



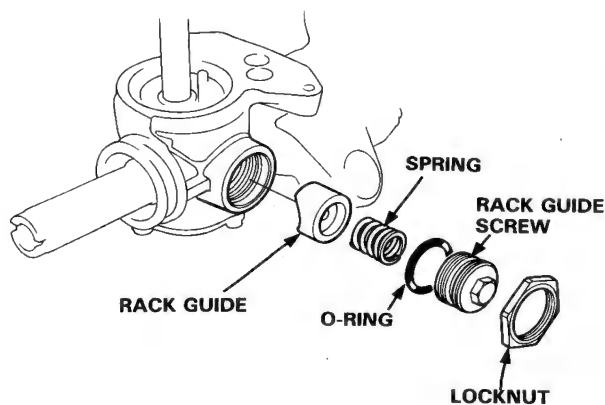
4. Remove the boot bands and tube clamps. Pull the dust seals away from the ends of the gearbox.



5. Hold the steering rack with a 19 mm wrench and unscrew the rack end with a wrench.



6. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.
7. Loosen the rack screw locknut and remove the rack guide screw.
8. Remove the spring and rack guide from the gear housing.

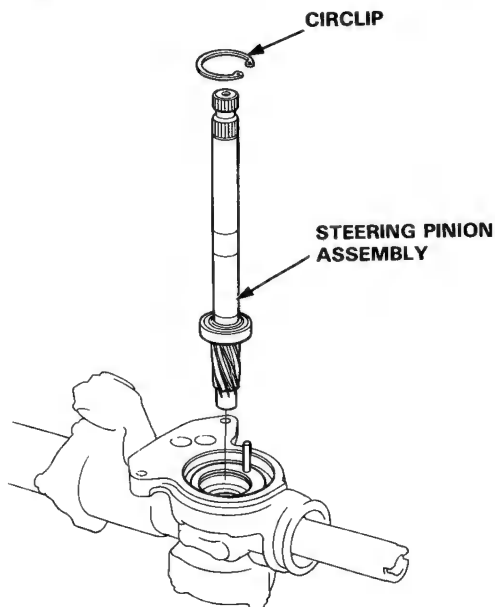


(cont'd)

Steering Gearbox (LHD)

Overhaul (cont'd)

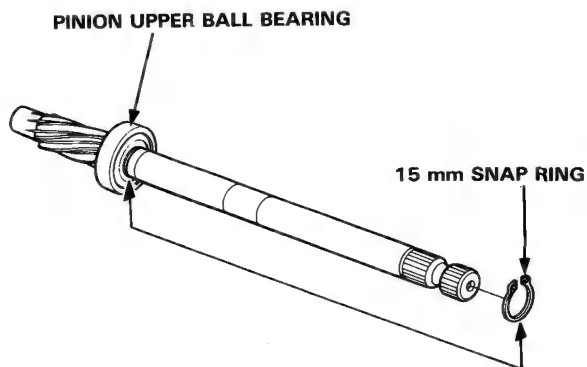
9. Remove the steering pinion assembly by removing the circlip.



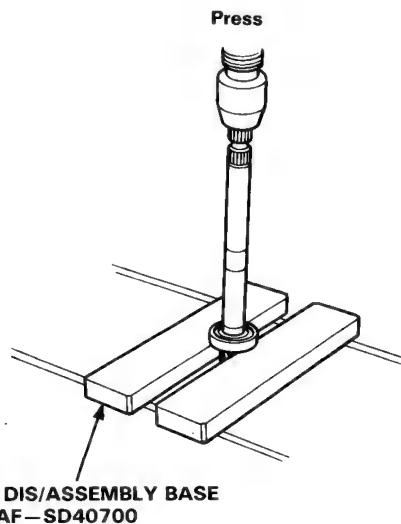
- Check the pinion upper ball bearing for play; if it is good and the grease in it is clean, go on step 10.

If the bearing is noisy or has excessive play, replace the bearing.

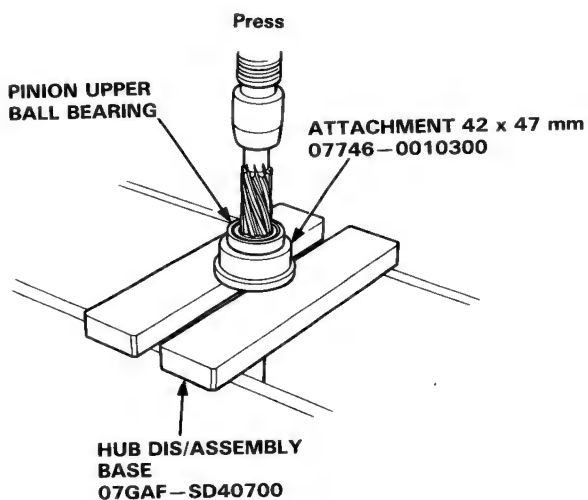
- Remove the 15 mm snap ring.



- Remove the ball bearing using the special tool.

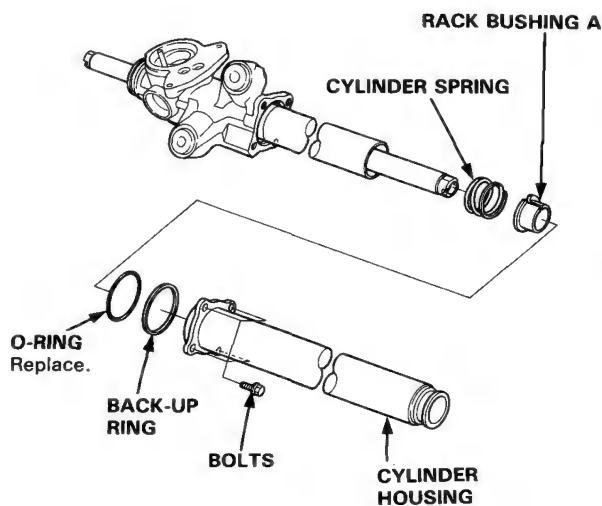


- Using a press, install the upper ball bearing on the pinion.



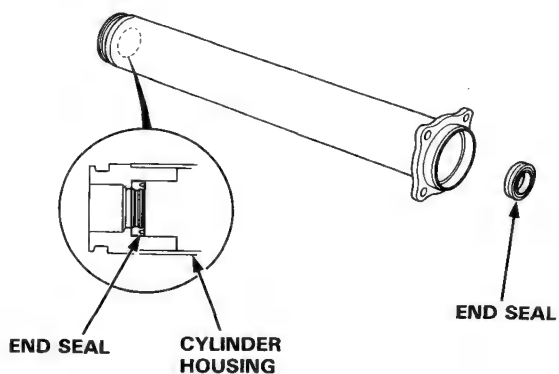


10. Remove the four bolts from the end of the cylinder housing, then slide the housing off the rack.
11. Remove the O-ring, back-up ring, steering rack bushing A and cylinder spring.

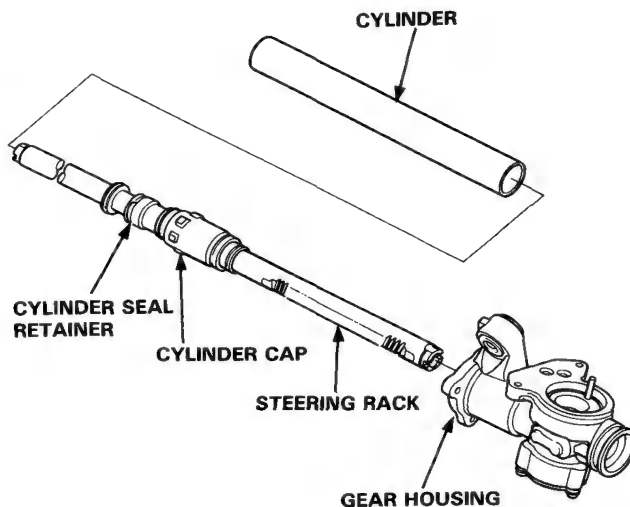


12. Remove the cylinder end seal from the cylinder housing.

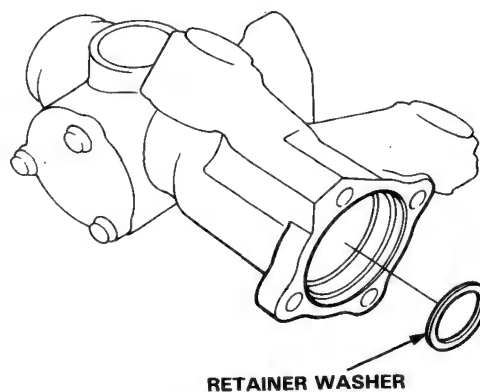
NOTE: Use your fingers or a wooden stick to avoid damaging the housing.



13. Remove the cylinder, cylinder seal retainer, cylinder cap and steering rack from the gear housing.



14. Remove the retainer washer from the gear housing.



(cont'd)

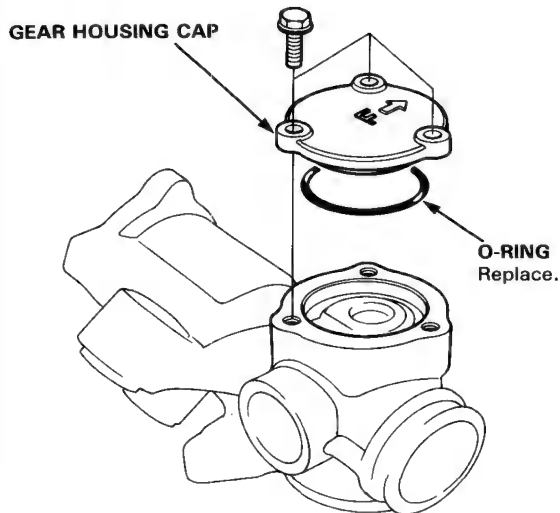
Steering Gearbox (LHD)

Overhaul (cont'd)

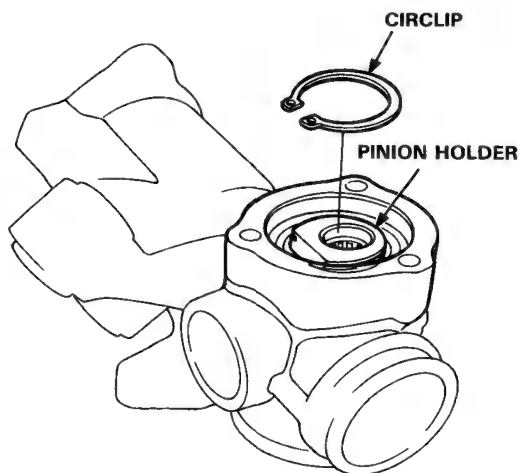
- Check the pinion holder for free movement, excessive play and rough movement; if it is good go on step 15.

If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.

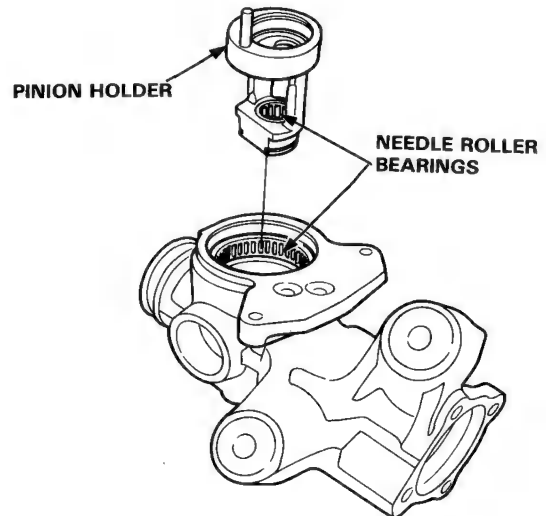
- Remove the gear housing cap from the gear housing.



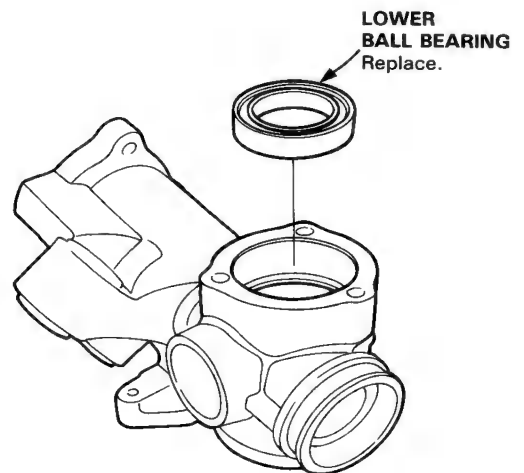
- Remove the circlip from the pinion holder.



- Remove the pinion holder from the gear housing.
- Check the needle roller bearings in the pinion holder and gear housing for damage; if OK, pack the needle roller bearing with grease. If the bearings are damaged, replace them as a set.

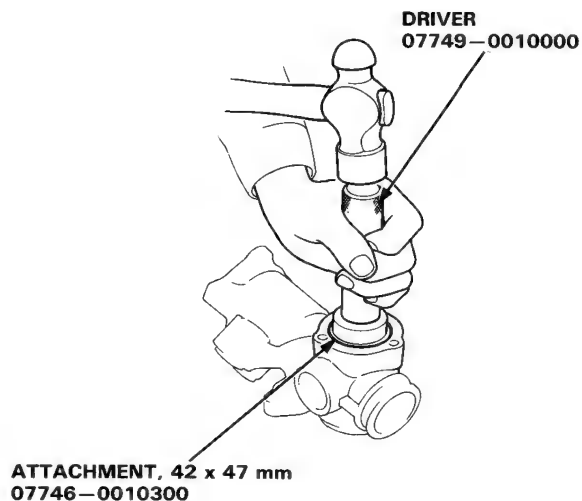


- Check the lower ball bearing for damage; If it is damage, replace the lower ball bearing.
- Remove the pinion lower ball bearing from the gear housing.

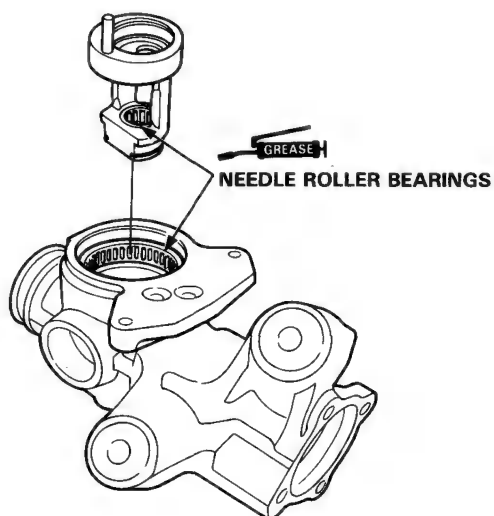




- Drive the new lower ball bearing into the gear housing using the special tools.



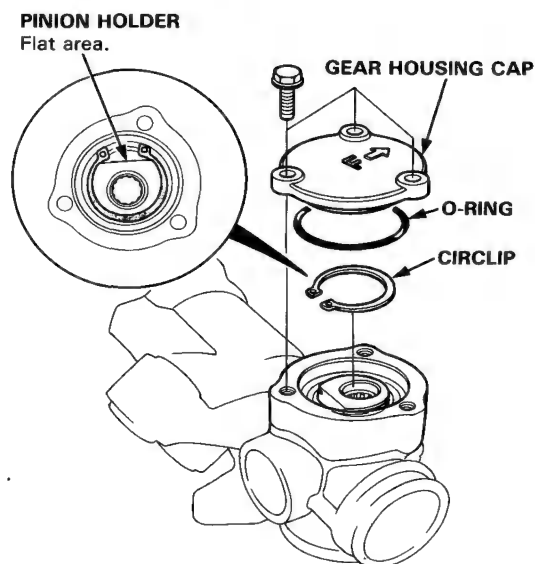
- Install the pinion holder in the gear housing.



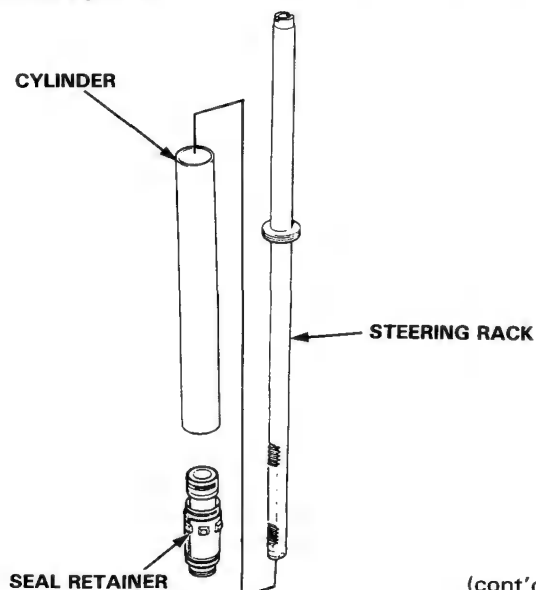
- Reinstall the circlip with its tapered side facing out.

NOTE: Circlip ends must be aligned with the flat area.

- Grease the new O-ring and install it in the groove in the gear housing cap. Install the gear housing cap and tighten the bolts securely.



15. Remove the cylinder and seal retainer from the steering rack.



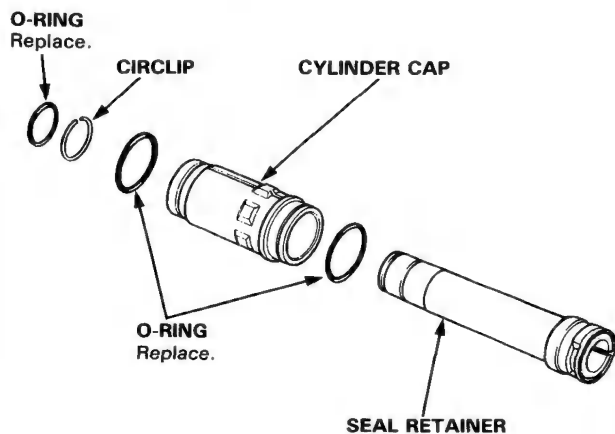
(cont'd)

Steering Gearbox (LHD)

Overhaul (cont'd)

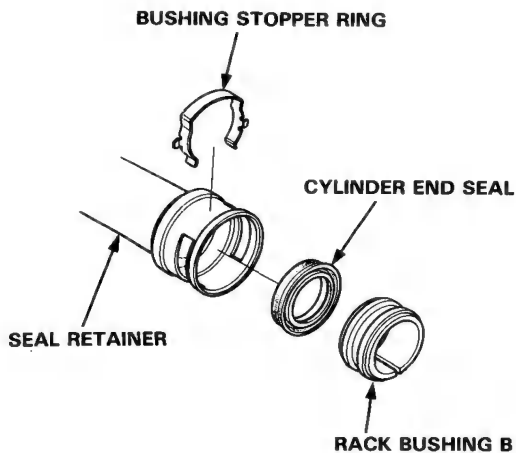
16. Remove the O-ring and circlip from the seal retainer, then remove the cylinder cap from the seal retainer.

17. Remove the O-rings from the cylinder cap.

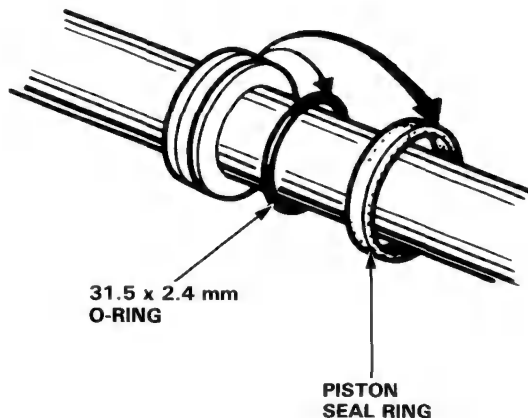


18. Remove the bushing stopper ring from the seal retainer.

19. Remove the cylinder end seal.



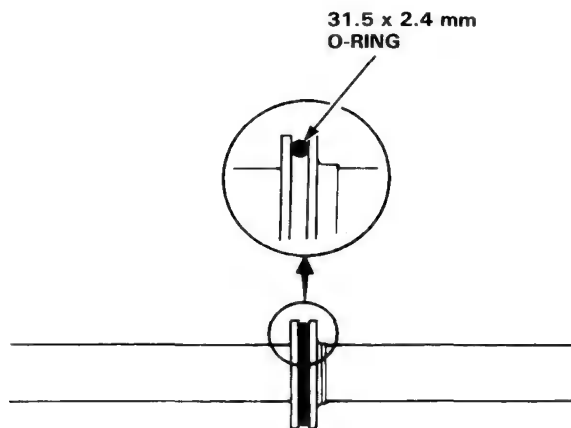
20. Carefully pry the piston seal ring and O-ring off the rack.



Assembly

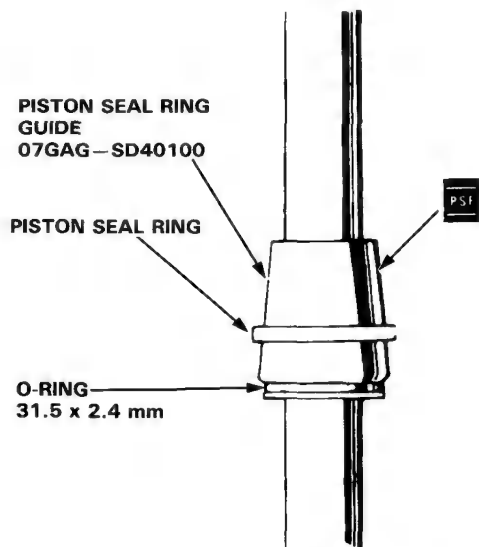
NOTE: Before reassembling any parts inspect them as discribed on page 17-92 and make sure they are clean. Replace worn or damaged parts.

21. Install a new O-ring on the rack.

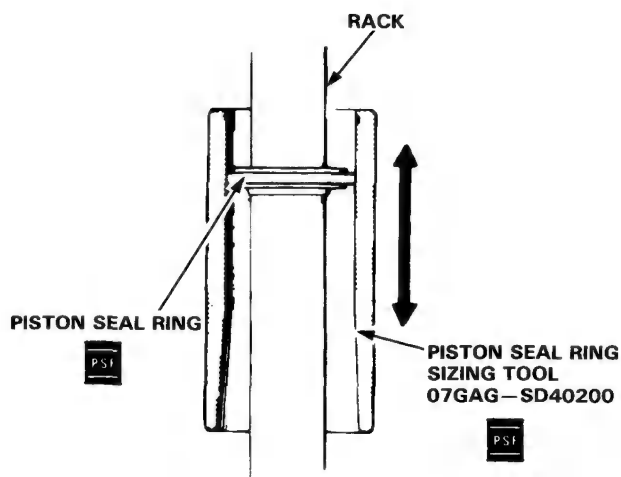




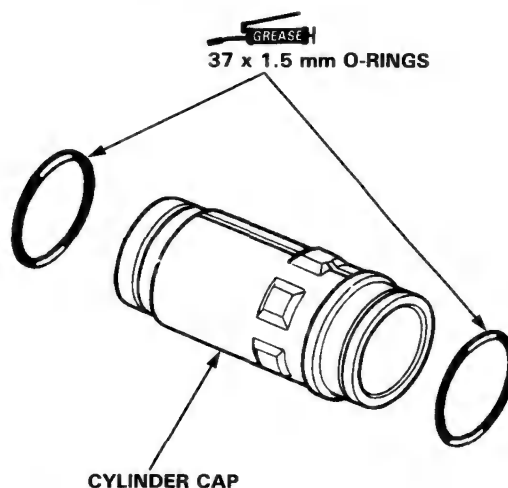
22. Coat the piston seal ring guide with power steering fluid, and slide it onto the rack, big end first.
23. Position the new piston seal ring on the special tool, slide it down to big end of the tool, and then pull it off into the piston groove on top of the O-ring.



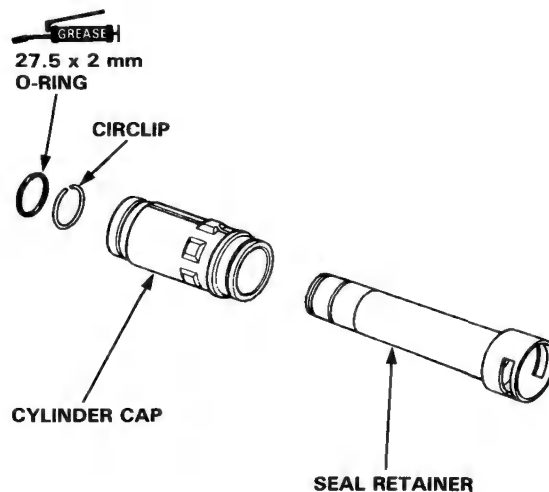
24. Coat the piston seal ring and inside of the special tool with power steering fluid. Carefully slide the tool onto the rack and over the piston ring, then rotate the tool as you move it up and down to seat the piston seal ring.



25. Coat new O-rings with grease and install them on the cylinder cap.



26. Slide the cylinder cap onto the seal retainer.
27. Install the circlip and O-ring on the seal retainer.

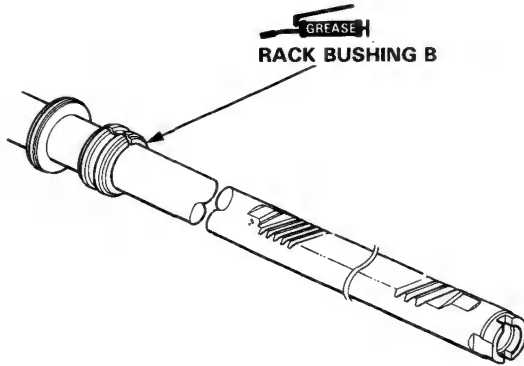


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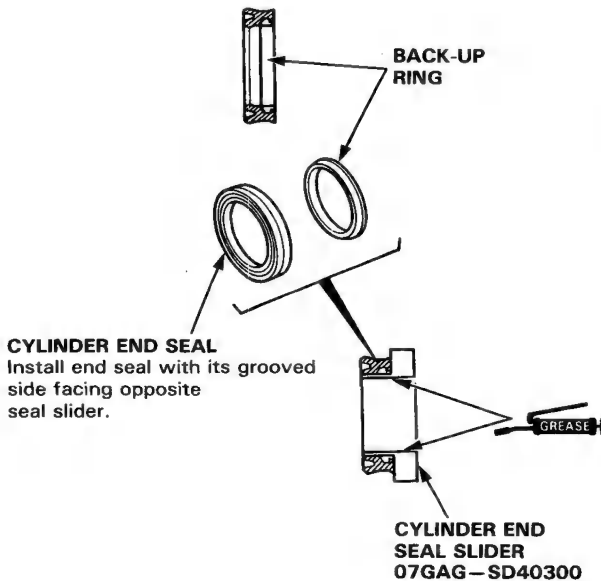
Steering Gearbox (LHD)

Overhaul (cont'd)

28. Grease the sliding surface of the steering rack bushing B, and install the bushing on the steering rack with the groove of the bushing facing the steering rack piston.

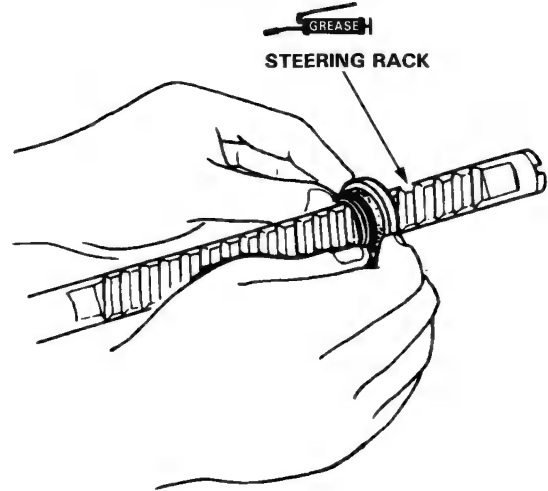


29. Grease the sliding surfaces of the new cylinder end seal and the special tool, then place the seal on the special tool with its grooved side facing opposite the slider.

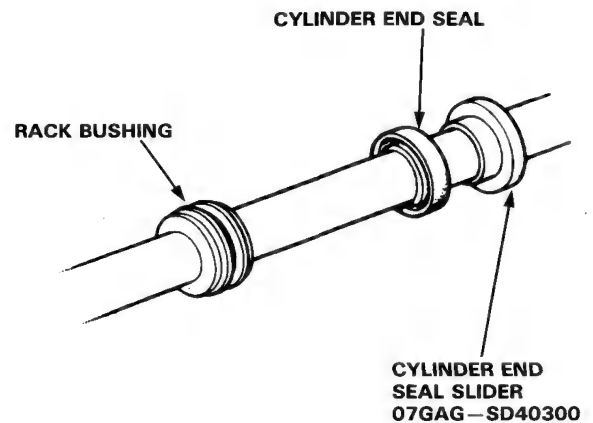


30. Grease the steering rack, and install the special tool.

CAUTION: Make sure the rack teeth do not face the slot in the special tool.

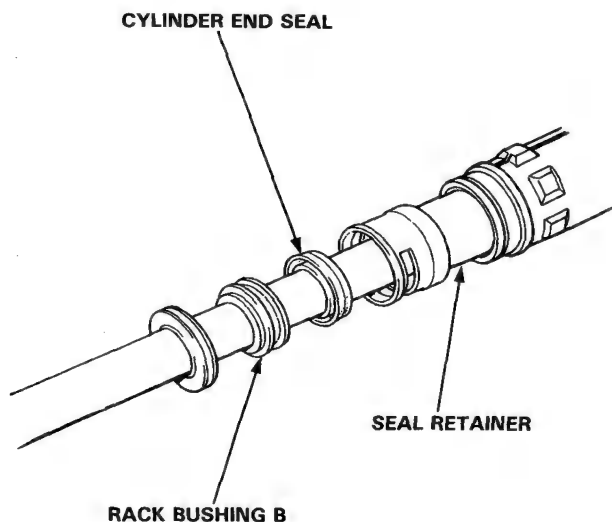


31. Separate the cylinder end seal from the special tool, then remove the tool from the rack.

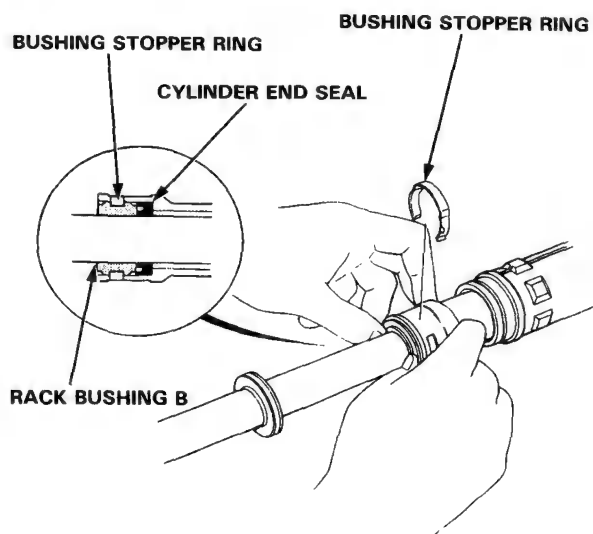




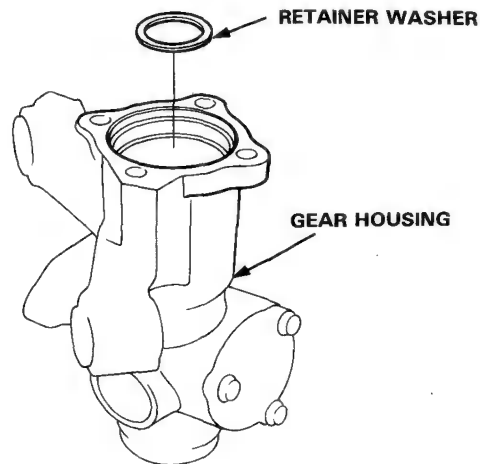
32. Fit the seal retainer on the steering rack.



33. Push the rack bushing B toward the seal retainer by hand until the cylinder end seal is seated in the retainer. Fit the seal stopper ring in the groove of the seal retainer securely. Then grease the steering rack.

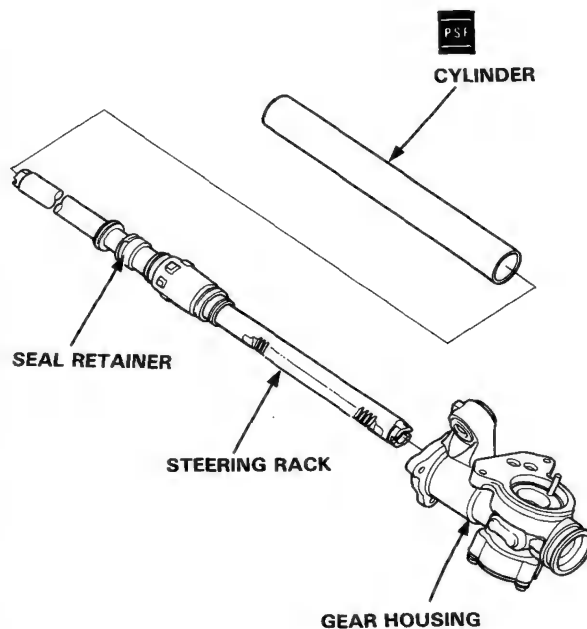


34. Install the retainer washer on the gear housing.



35. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.

36. Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.

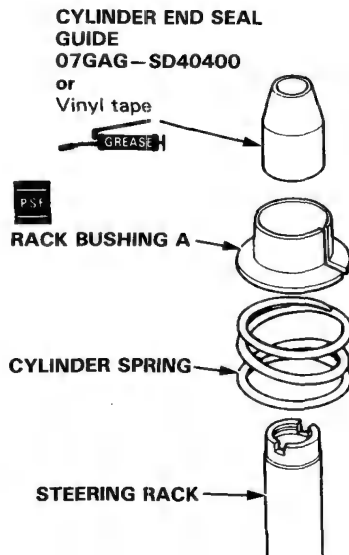


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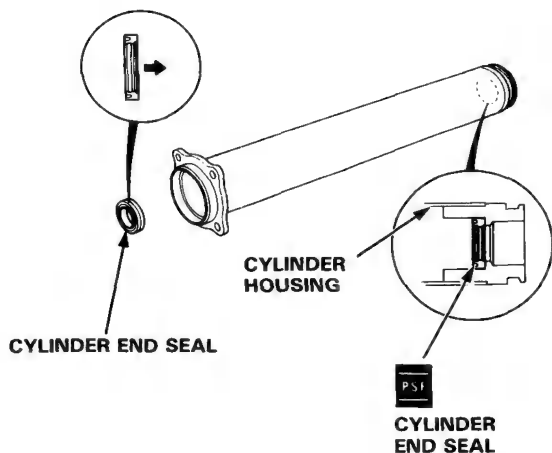
Steering Gearbox (LHD)

Overhaul (cont'd)

37. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid and install it on the spring.
38. Install the special tool, or apply vinyl tape onto the steering rack and coat the special tool or vinyl tape with grease.



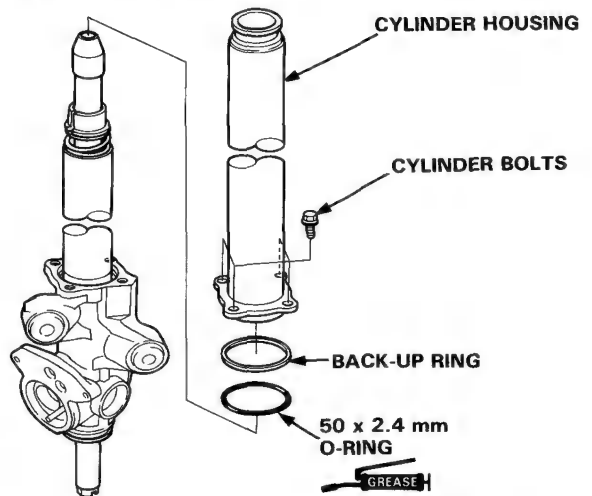
39. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its grooved side facing out.



40. Install the O-ring and back-up ring on the gear housing.

41. Carefully position the cylinder housing on the gear housing and loosely install with four bolts.

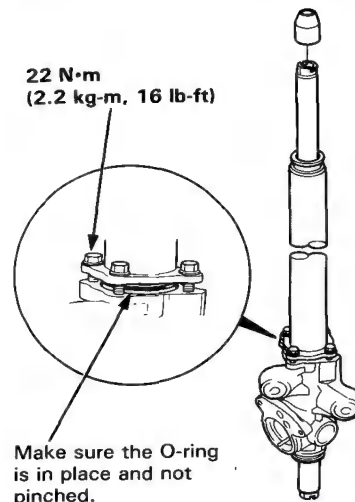
CAUTION: Be careful not to damage the end seal in the cylinder housing.



42. Remove the vinyl tape or special tool from the steering rack.

43. Tighten the cylinder housing to the gear housing.

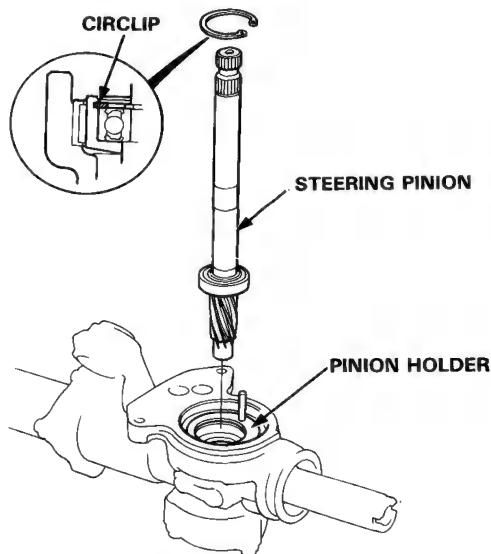
NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housing fit properly by pushing them together; hold them together while tightening the bolts.



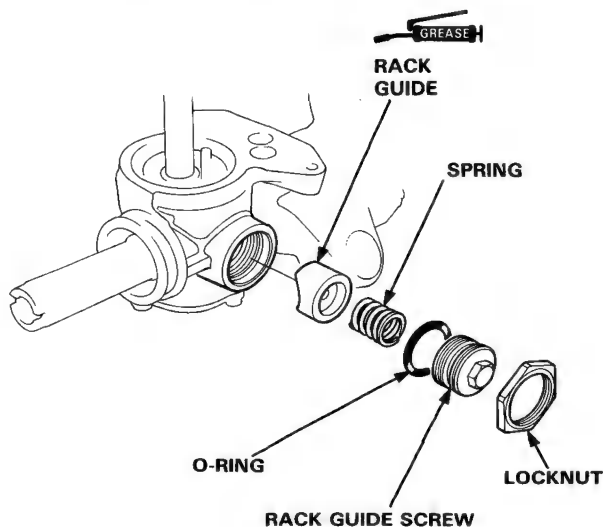


44. Install the steering pinion in the pinion holder.
45. Install the circlip securely in the pinion holder groove.

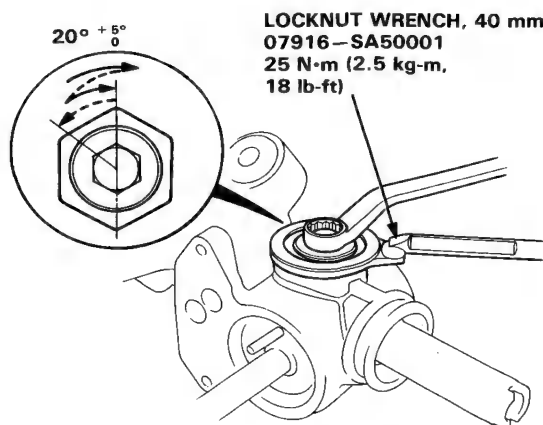
NOTE: Install the circlip with its tapered side facing out.



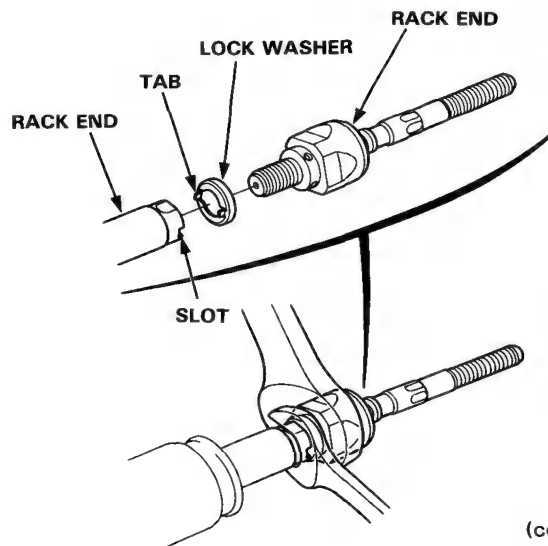
46. Install the O-ring on the rack guide screw.
47. Coat the rack guide with grease.
48. Install the rack guide, spring and rack guide screw on the gear housing.



49. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.
50. Retighten it to $4 \text{ N}\cdot\text{m}$ ($0.4 \text{ kg}\cdot\text{m}$, $2.9 \text{ lb}\cdot\text{ft}$), back it off about $20^\circ +5^\circ_0$ then install the locknut on the rack guide screw.
51. Tighten the locknut while holding the rack guide screw with the special tool.



52. Install the valve body unit (page 17-88).
53. Install the new lock washer in the groove in the steering rack.
54. Hold the steering rack with a wrench and tighten the rack end to $55 \text{ N}\cdot\text{m}$ ($5.5 \text{ kg}\cdot\text{m}$, $40 \text{ lb}\cdot\text{ft}$).



(cont'd)

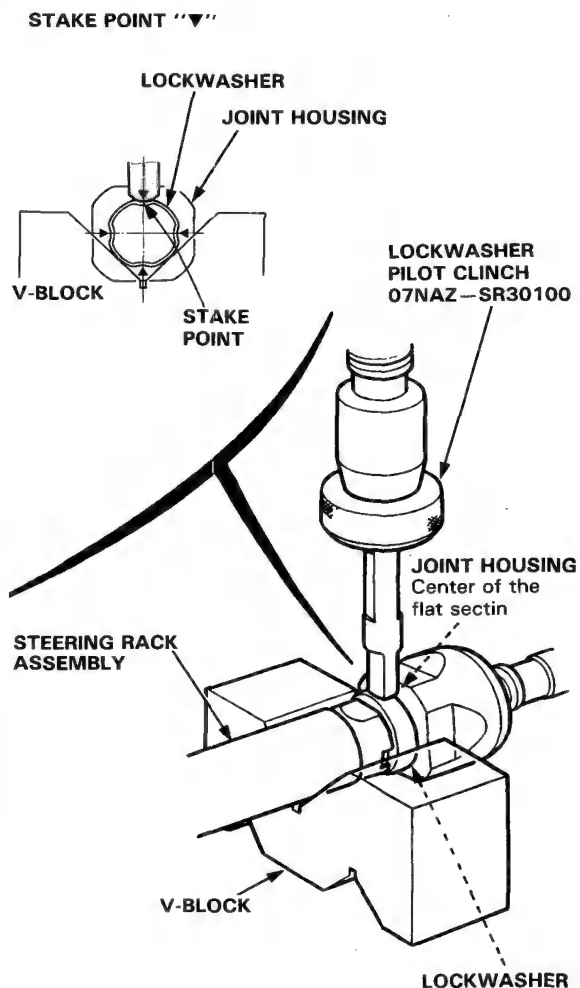
Steering Gearbox (LHD)

Overhaul (cont'd)

55. After tightening the rack end stake the four section of lockwasher with the special tool and hydraulic press.

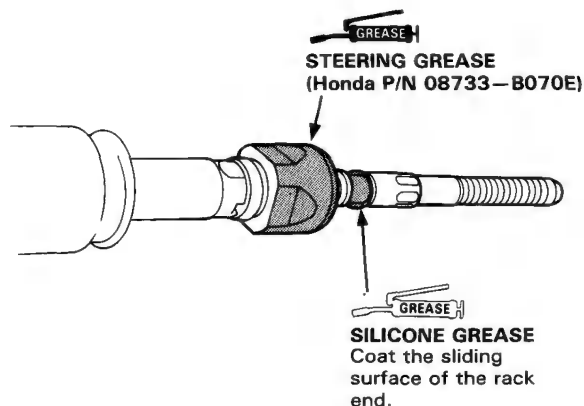
NOTE: Set the V-block on the press table. Set the lockwasher section of the rack end on the V-block securely.

- Be sure that the pressing direction, special tool, and each lockwasher stake position are in line.
- Stake the lockwasher in the center of the flat section of the joint housing. (The bottom end of the stake must be in that position) See below.

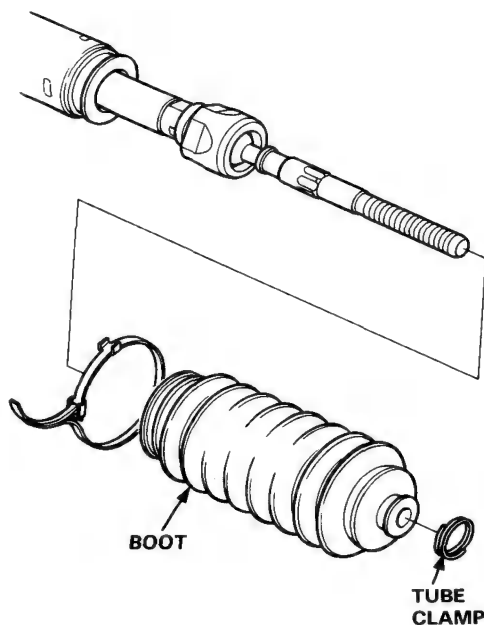


56. Apply steering grease to the circumference of the rack end housing.

NOTE: Coat the rack end groove and inside of the boot with silicone grease.



57. Install the boots on the rack end with the tube clamps.





NOTE: Install the boot band with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).

58. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)

59. Install new boot bands on the boot and bend both sets of locking tabs.

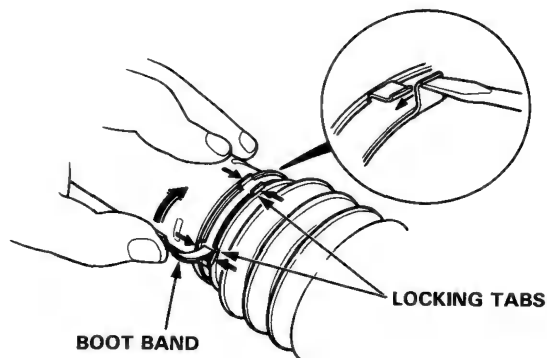
60. Lightly tap on the doubled-over portions to reduce their height.

CAUTION: Stake the band locking tabs firmly.

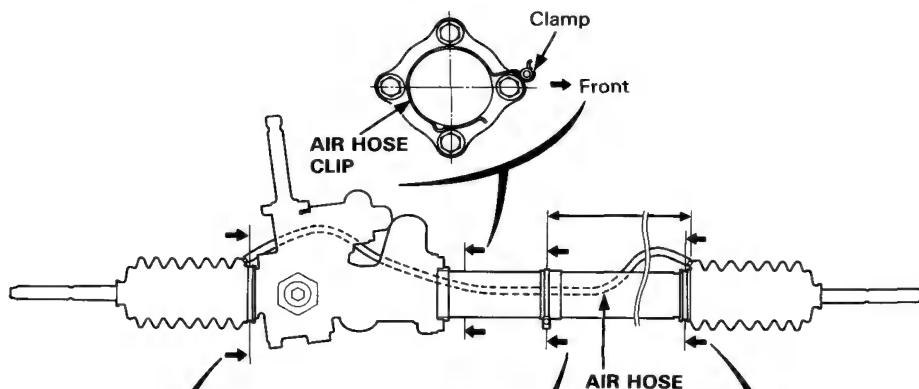
61. Install the band cushion and air hose band; position the band as shown and tighten it. Then install the air hose.

62. After assembling, slide the rack right and left to be certain that the boots are not deformed or twisted.

63. Install the right and left tie-rods on the right and left rack ends.



AIR HOSE CLIP
(Viewed from the right side)



LOCKING TABS

The locking tabs (stake points) should be in this range.

$70^\circ \pm 10^\circ$

Front.

TUBE JOINT

OFFSET SHAFT CENTER LINE

Left Dust Seal Band
(Viewed from the left side)

OFFSET SHAFT CENTER LINE

$90^\circ \pm 10^\circ$

Front.

Clump

6 mm
(0.24 in)

Air Hose Band
(Viewed from the right side)

$49^\circ \pm 10^\circ$

Band winding direction.

TUBE JOINT

Front.

OFFSET SHAFT CENTER LINE

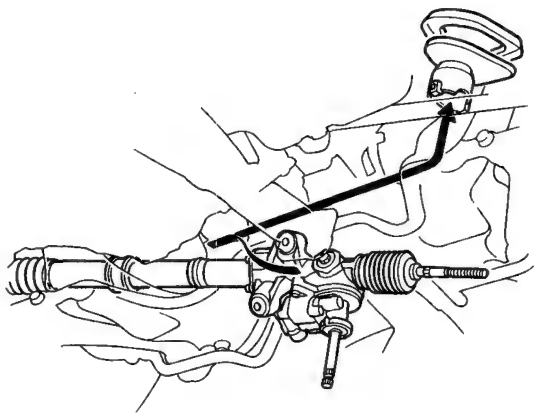
LOCKING TABS
The locking tabs (stake points) should be in this range.

Right Dust Seal Band
(Viewed from the right side)

Steering Gearbox (LHD)

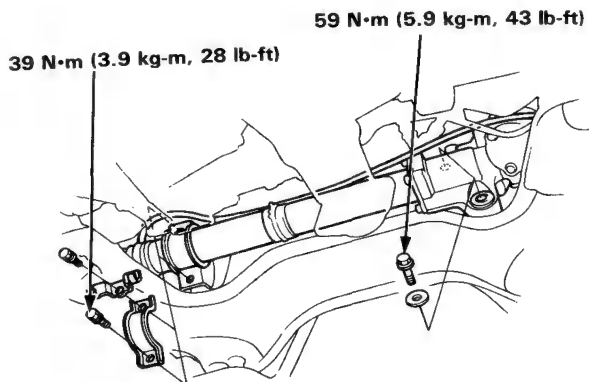
Installation

1. Slide the rack all the way to the right.
2. Pass the right side of the steering gearbox assembly above and through the right side of the rear beam.
3. Hold the steering gearbox assembly and slide the rack all the way to the right.
4. Raise the left side of the steering gearbox assembly above and through the left side of the rear beam.
5. Install the pinion shaft grommet and insert the pinion shaft up through the bulkhead.

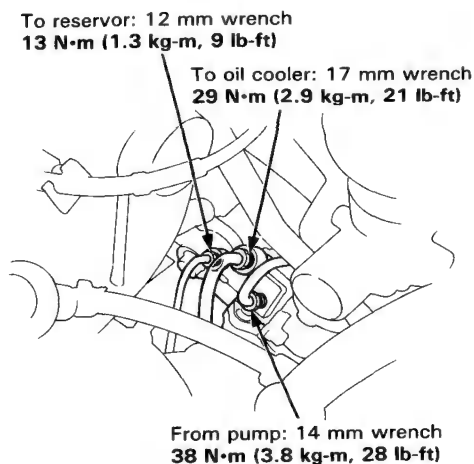


NOTE: Install the performance rod, if it is equipped.

6. Install and tighten the gearbox mounting bolts.

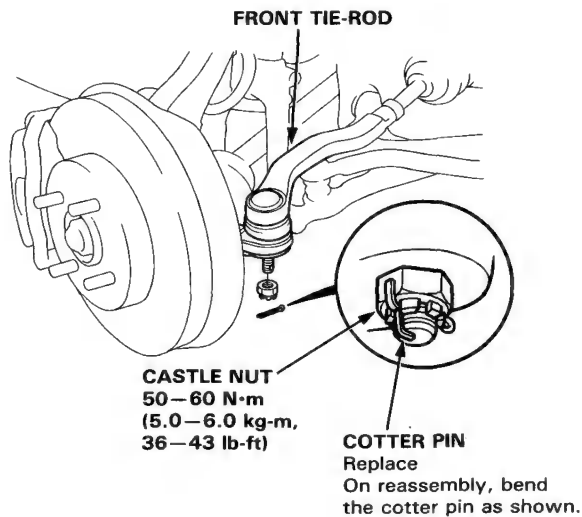


7. Connect the fluid lines to the control unit.



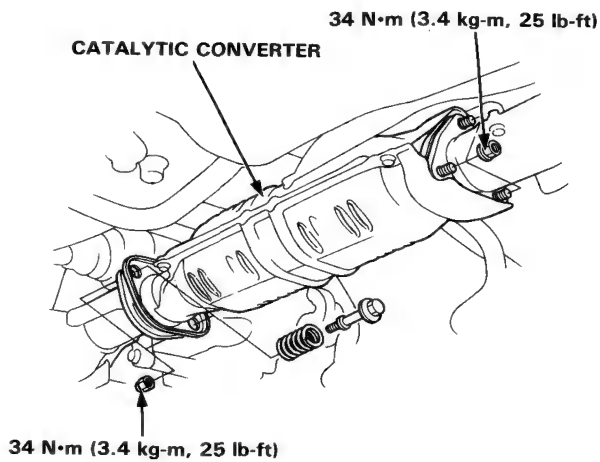
8. Reconnect the tie-rods to the steering knuckles, tighten the ball joint nut to the specified torque, and install new cotter pins.

CAUTION: Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



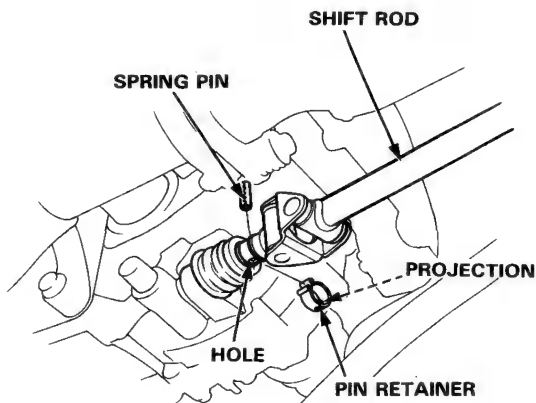


9. Install the catalytic converter with the new gaskets and self-locking nuts.

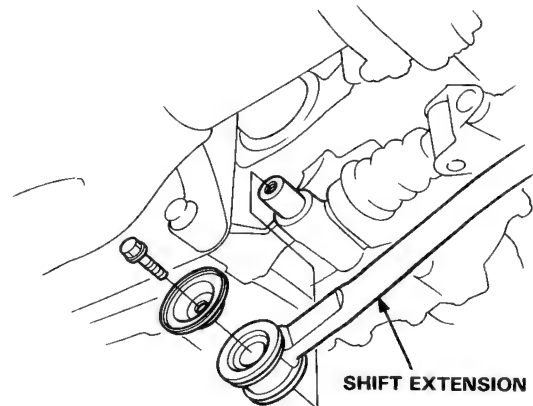


(Manual transmission model only)

- Connect the shift rod to the transmission and drive the spring pin with a punch, then install the pin retainer. Be sure that the projection on the pin retainer is in the hole.

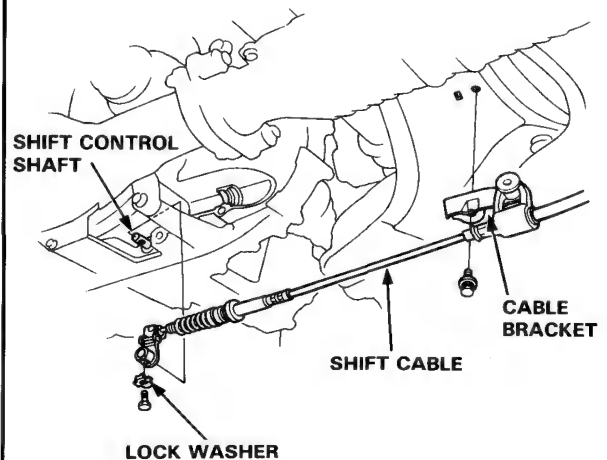


- Install the shift extension on the transmission case.



(Automatic transmission model only)

- Connect the shift cable end to the shift control shaft, and install the cable bracket.

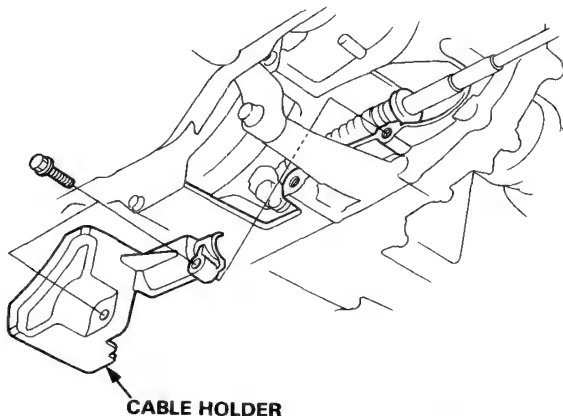


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Steering Gearbox (LHD)

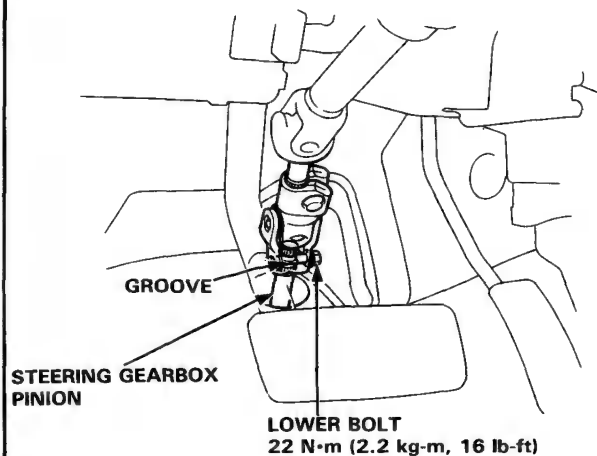
Installation (cont'd)

- Install the cable holder.

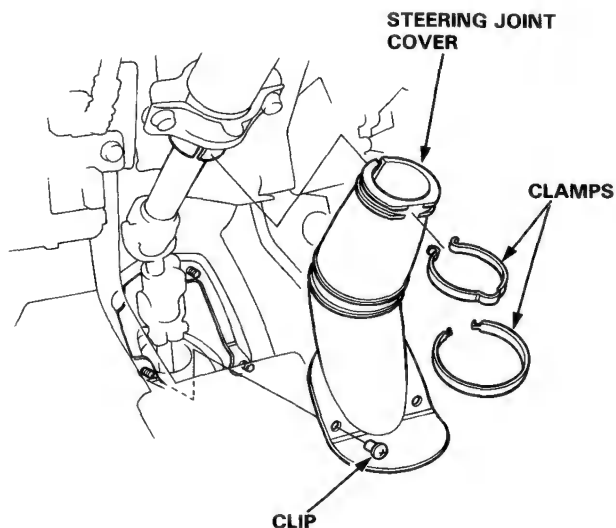


10. Reconnect the steering shaft to the gearbox.

CAUTION: Before tightening the steering joint bolts pull the steering joint to make sure that the steering joint is fully seated.



11. Install the steering joint cover with the clamps and clip.



12. Fill the system:

- Fill the reservoir with new Honda Power Steering Fluid-V.
- Connect the battery positive terminal and then connect the negative terminal.

13. After installation, perform the following checks.

- Start the engine and let it run at fast idle, then turn the steering wheel from lock-to-lock several times to bleed air from the system.
- Check the fluid again, and add more if necessary.
- Check the gearbox for leaks.
- Check the front toe.
- Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

NOTE: Turn the right and left tie-rods equally.



Steering Gearbox (RHD)

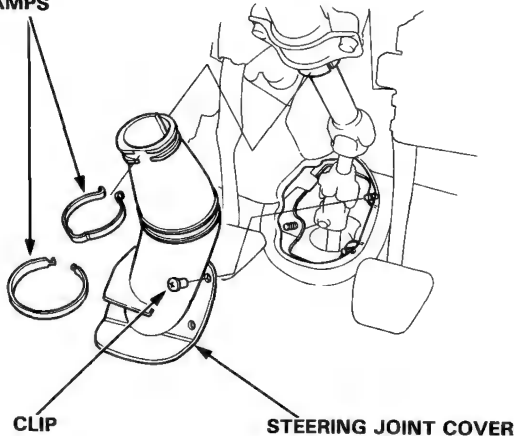
Gearbox Removal

NOTE:

- Before removing the steering gearbox, align the front wheels straight ahead.
- Disconnect the battery negative terminal and then disconnect the positive terminal.

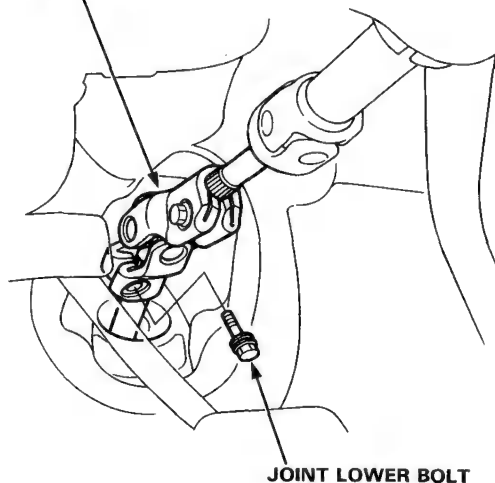
1. Drain the power steering fluid as described on page 17-62.
2. Remove the steering joint cover.

CLAMPS



3. Remove the steering joint lower bolt, and move the joint toward the column.
4. Raise the front of car and support on safety stands in the proper locations.
5. Remove the front wheels.

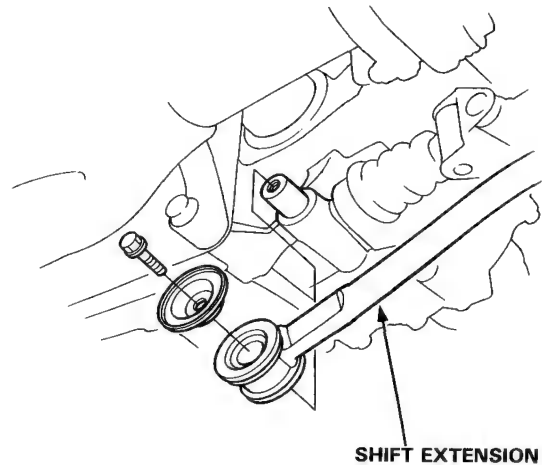
STEERING JOINT



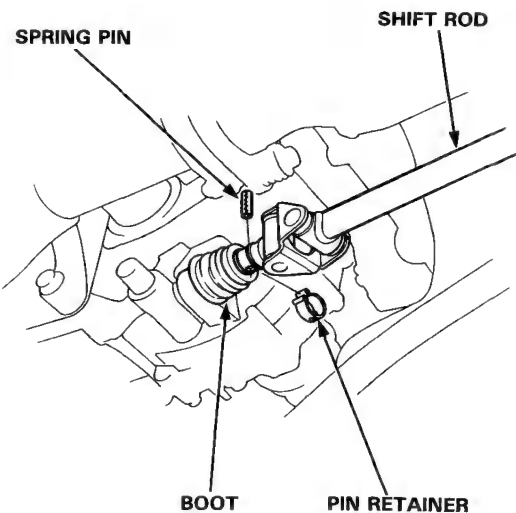
6. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and the end of the gearbox. Blow dry with compressed air.

(Manual transmission model only)

- Remove the shift extension from the transmission case.



- Slide the boot back at the connecting position of the gear shift rod.
- Drive out the spring pin with a punch, then disconnect the shift rod.



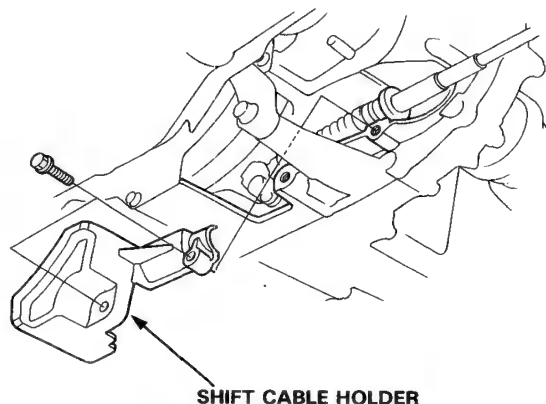
(cont'd)

Steering Gearbox (RHD)

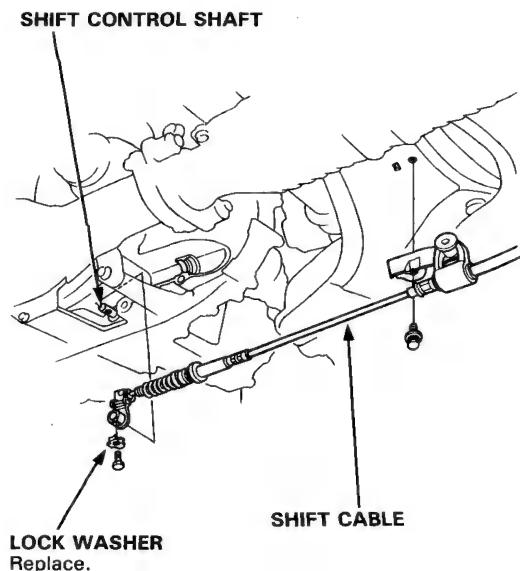
Gearbox Removal (cont'd)

(Automatic transmission only)

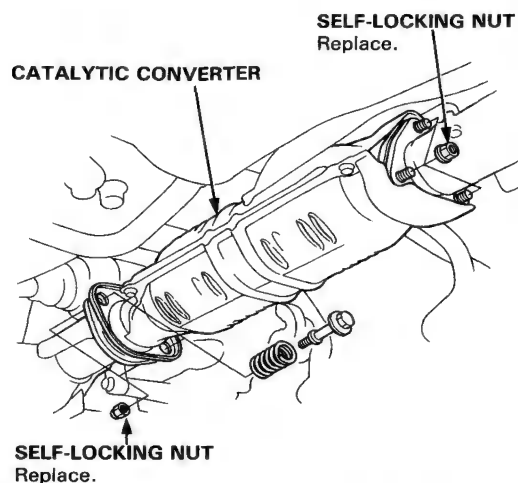
- Remove the shift cable holder.



- Disconnect the shift cable from the shift control shaft.



7. Separate the catalytic converter by removing the self-locking nuts.



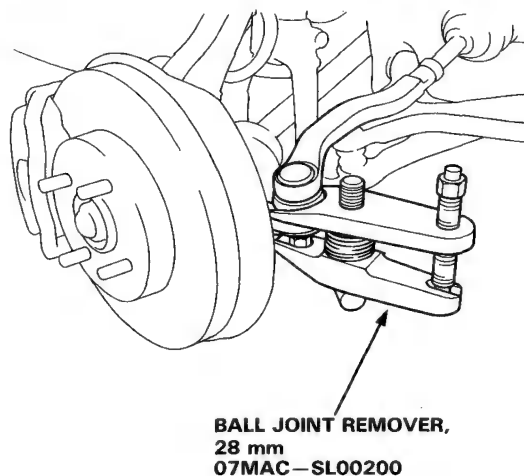
8. Remove the cotter pin from the tie-rod ball joint nut and remove the nut.

9. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Remove the ball joint using the Ball Joint Remover, 28 mm (07MAC—SL00200). Refer to page 18-12 for how to use the ball joint remover.

10. Separate the tie-rod ball joint and knuckle using the special tool.

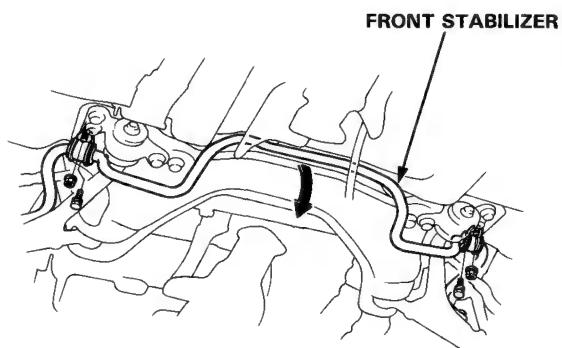
CAUTION: Avoid damaging the ball joint boot.



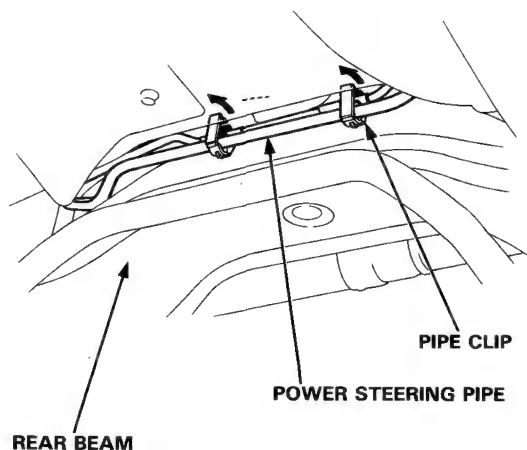


11. Remove the fastener from the front stabilizer mounting section and lower the front stabilizer.

NOTE: Do not disconnect the front stabilizer from the joint.

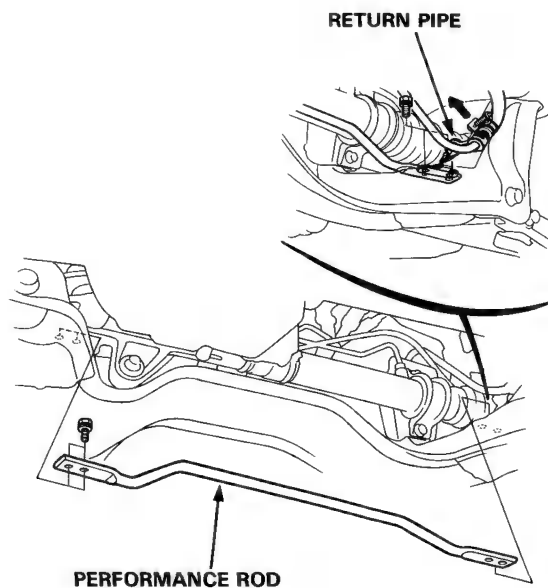


12. Remove the two power steering pipes from the pipe clips on the top of the rear beam. Remove the pipes from the rear side of the car.



13. Remove the return pipe clamp from the left side of the rear beam and move the return pipe above the gearbox.

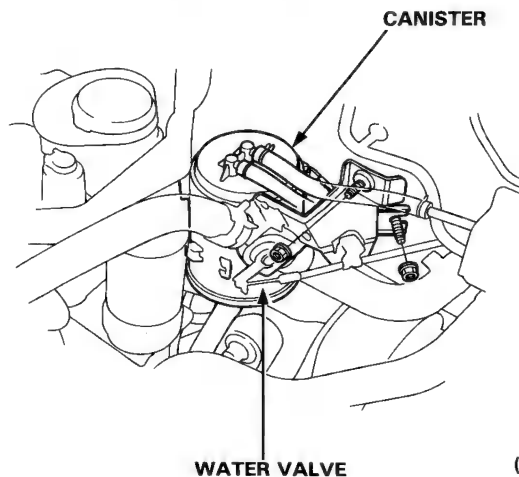
14. Remove the performance rod, if it is equipped.



15. Move the canister up and remove it.

16. Disconnect the cable from the water valve and remove the valve from the frame.

NOTE: Do not disconnect the hoses from the canister and the water valve. Move them aside.



(cont'd)

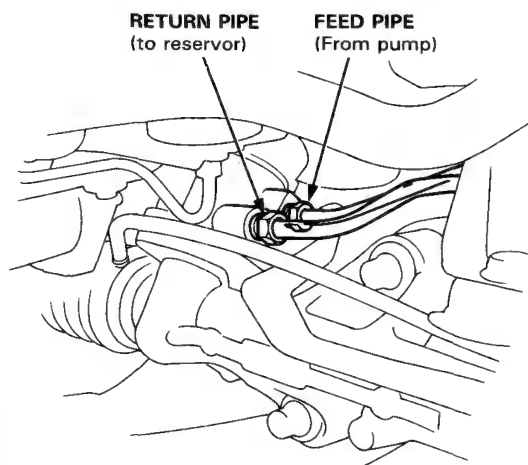
Steering Gearbox (RHD)

Gearbox Removal (cont'd)

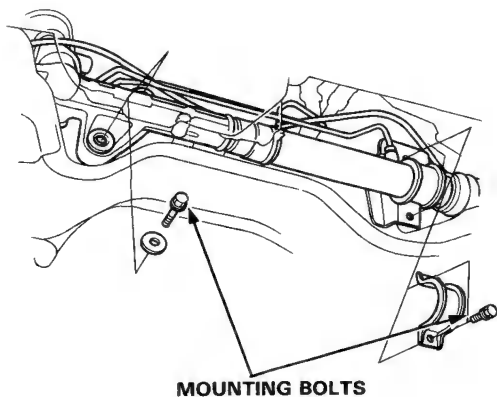
17. Disconnect the two pipes from the gearbox control.

CAUTION: After disconnecting the hoses and pipes, plug or seal the hoses and pipes with the piece of tape or equivalent to prevent foreign materials from entering the control unit.

NOTE: Move the disconnected two pipes behind the gearbox so that they do not interfere with the gearbox on its removal.

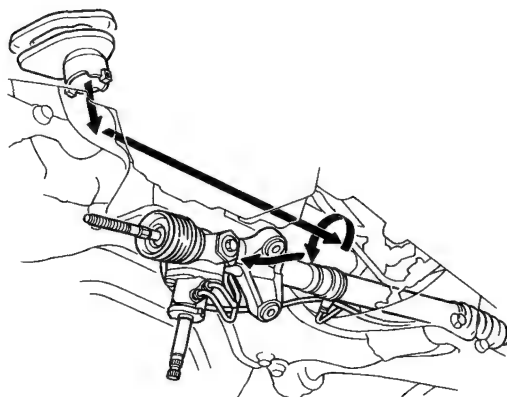


18. Remove the left tie-rod end, then slide the rack all the way to the right.
19. Remove the steering gearbox assembly mounting bolts and pinion shaft grommet.



NOTE: Check the mount bushings, dust seals, and other rubber parts for deterioration and damage. Replace if necessary.

20. Pull the steering gearbox assembly all the way down to clear the pinion shaft from the blukhead.
21. Move the steering gearbox assembly to the left so the right rack end clears the rear beam.
22. Hold the steering gearbox assembly and slide the rack all the way to the right, place the right rack end below the rear beam.
23. Move the steering gearbox assembly to the right and tilt the right side down to remove it from the car.



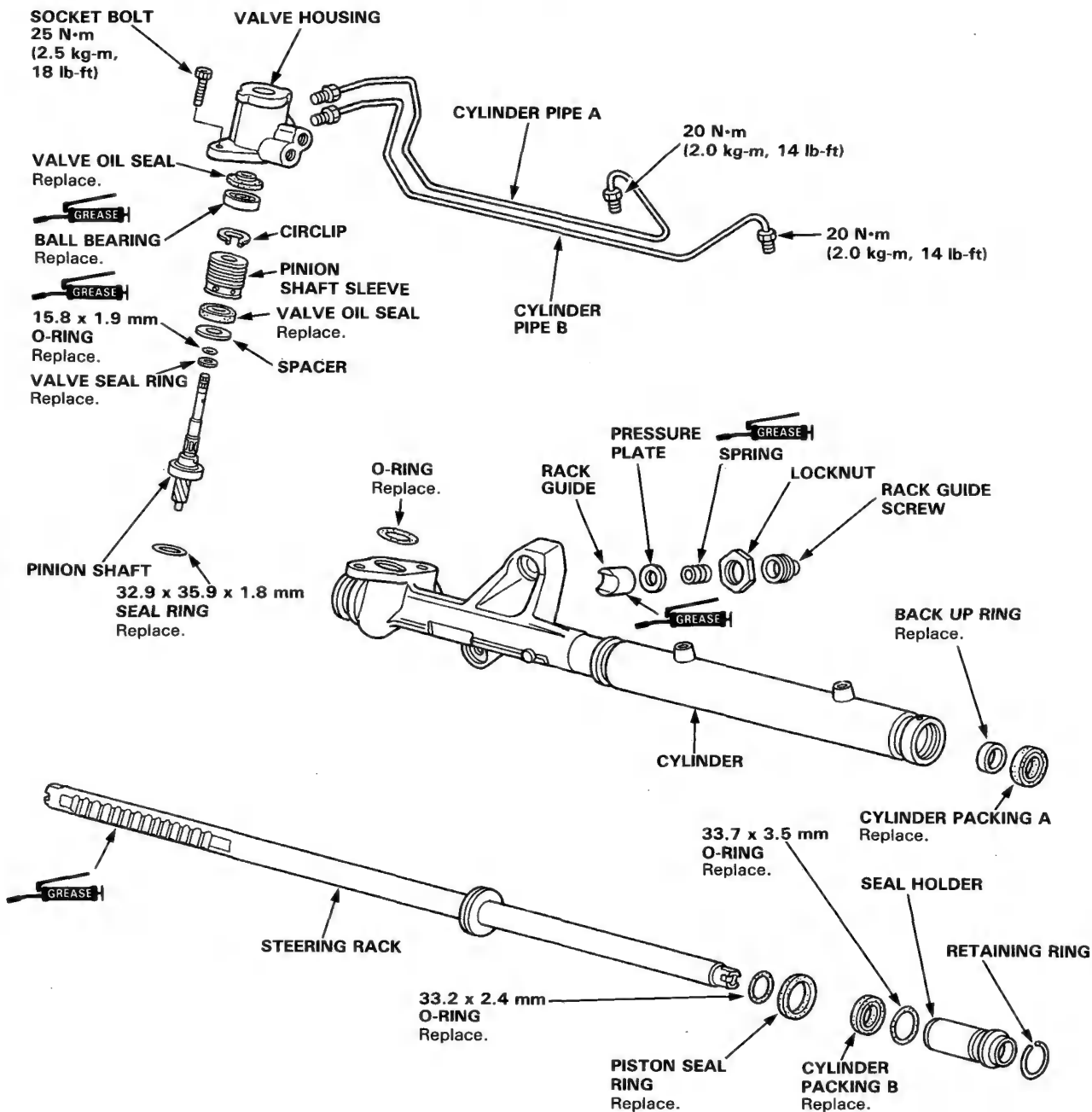


Illustrated Index

CAUTION:

- Before disassembling the gearbox, wash it off with solvent and a brush.
- Thoroughly clean all disassembled parts.
- Always replace O-rings and seals.
- Replace parts with damaged sliding surfaces.
- Do not dip seals and O-rings in solvent; coat O-rings with grease, make sure they stay in position during reassembly, and use appropriate special tools to install them where necessary.

-  **STEERING GREASE** Part Number 08733-B070E

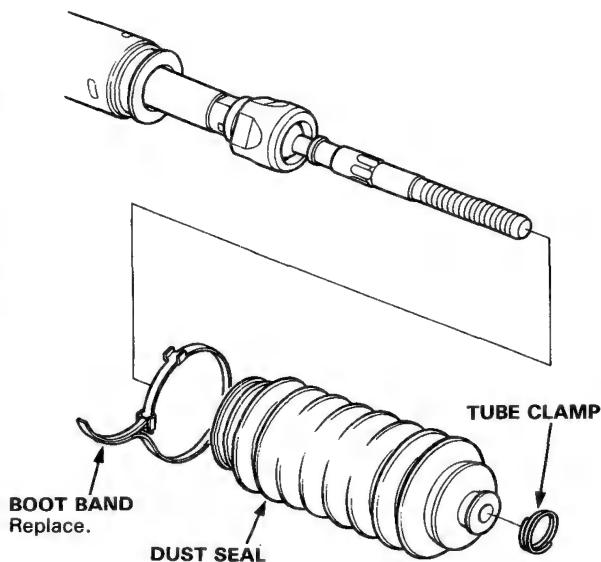


Steering Gearbox (RHD)

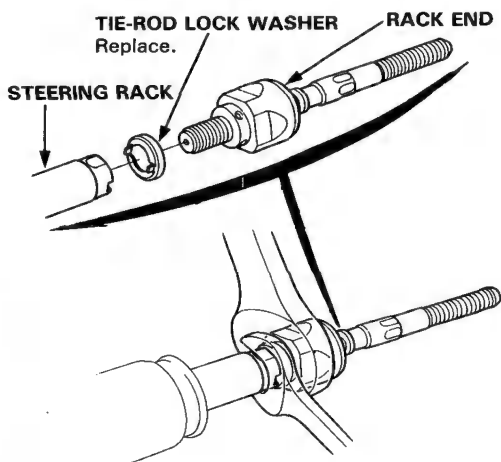
Overhaul

Disassembly

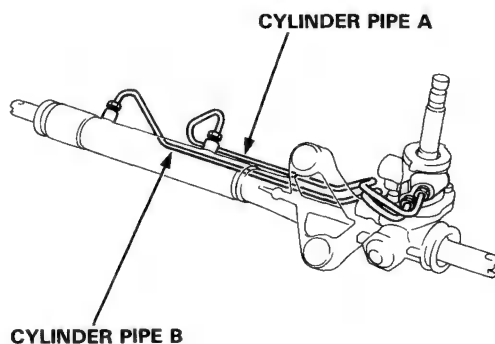
1. Remove the steering gearbox (page 17-109).
2. Carefully clamp the gearbox in a vise with soft jaws.
3. Remove the tie-rod assembly.
4. Remove the boot bands and tube clamps. Pull the dust seals away from the ends of the gearbox.



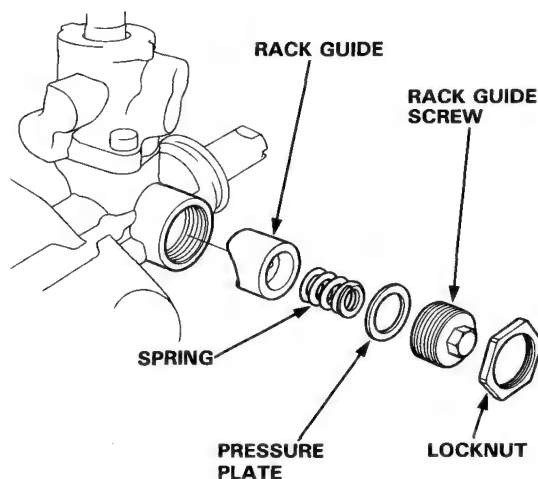
5. Hold the steering rack with a 19 mm wrench and unscrew the rack end with a wrench.



6. Remove the cylinder pipe A and B from the gearbox.

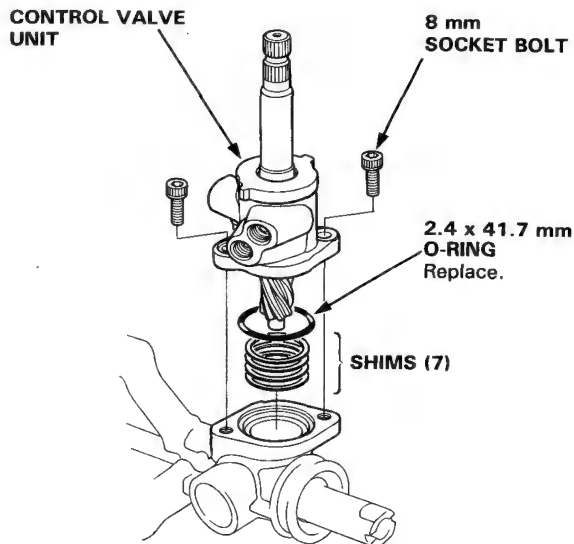


7. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.
8. Loosen the rack screw locknut and remove the rack guide screw.
9. Remove the spring, pressure plate and rack guide from the gear housing.



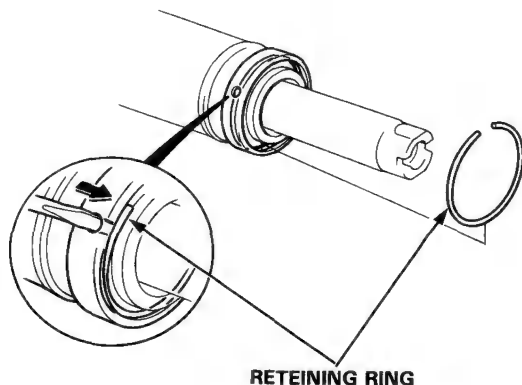


10. Remove the two socket bolts using a TORX T40 bit, then remove the control valve unit from the gearbox.

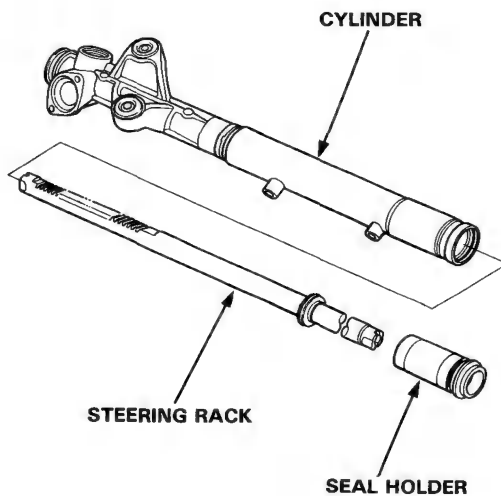


NOTE: Adjust the gear tooth contact using the shims whenever the control valve unit or the gearbox cylinder is replaced.

11. Remove the retaining ring from the cylinder using a narrow screw driver.

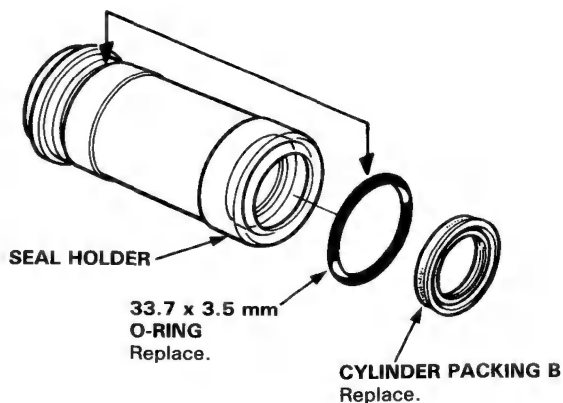


12. Remove the seal holder and steering rack from the cylinder housing.



13. Remove the O-ring and cylinder packing B from the seal holder.

CAUTION: Remove the O-ring and cylinder packing B with the fingers or a wood piece. Do not use a driver or other metal tools to remove them; it could damage the inside of the seal holder.



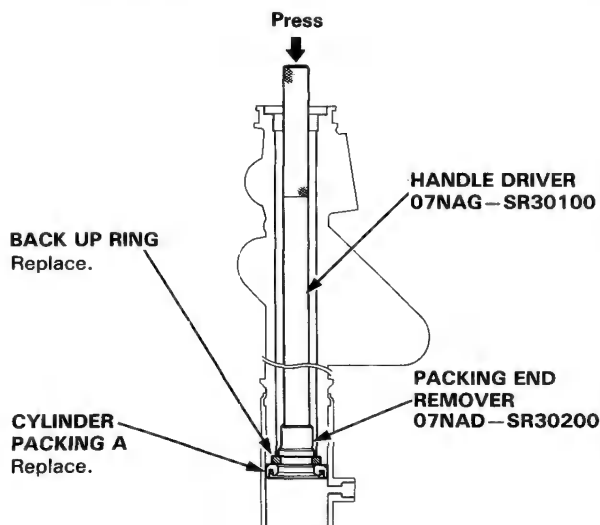
(cont'd)

Steering Gearbox (RHD)

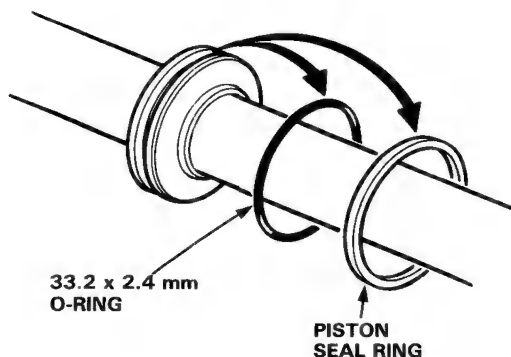
Overhaul (cont'd)

14. Replace the cylinder packing A and backup ring using the special tool.
15. Insert the special tool into the cylinder from the valve port side and drive out the cylinder packing A and backup ring using a press.

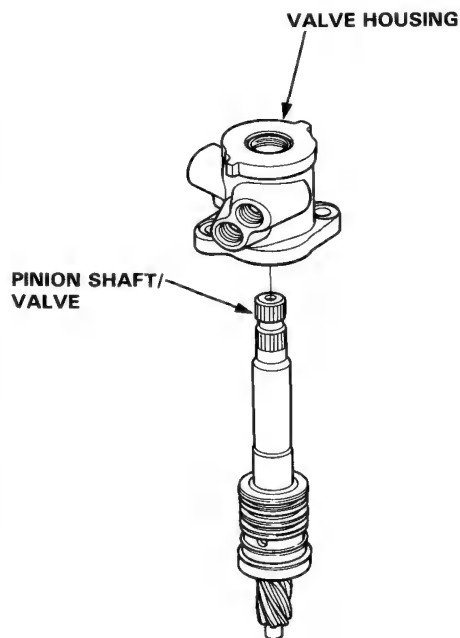
CAUTION: Do not try to remove the cylinder packing A and backup ring by tapping on the special tool. It could break the packing and a broken chip could be left in the cylinder.



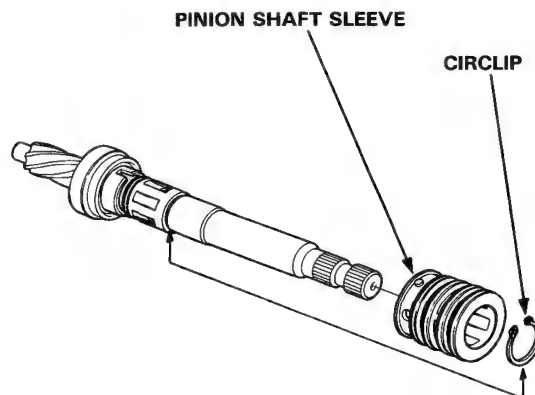
16. Carefully pry the piston seal ring and O-ring off the rack.



17. Separate the valve housing from the pinion shaft/valve by tapping on the shaft end with a plastic hammer.

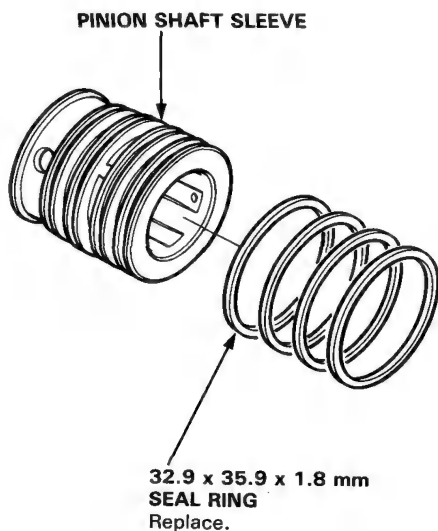


18. Remove the circlip and pinion shaft sleeve from the pinion shaft.

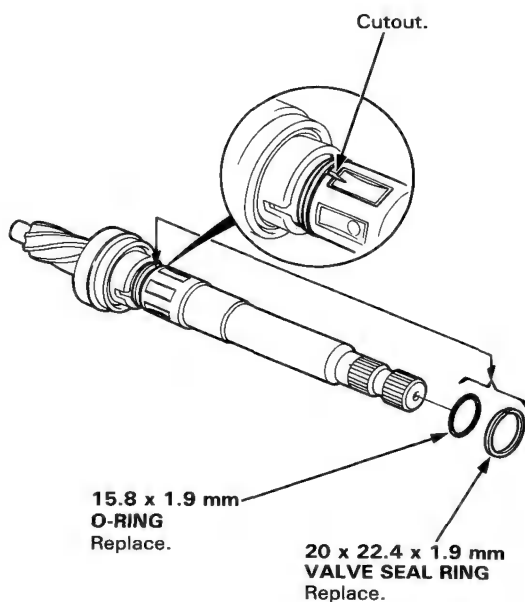




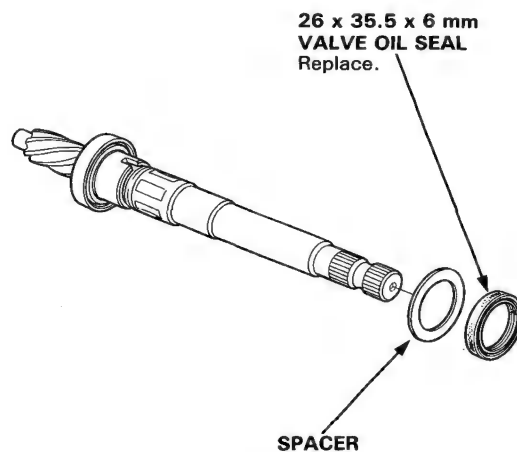
19. Remove the four seal rings from the pinion shaft sleeve with a wood piece.



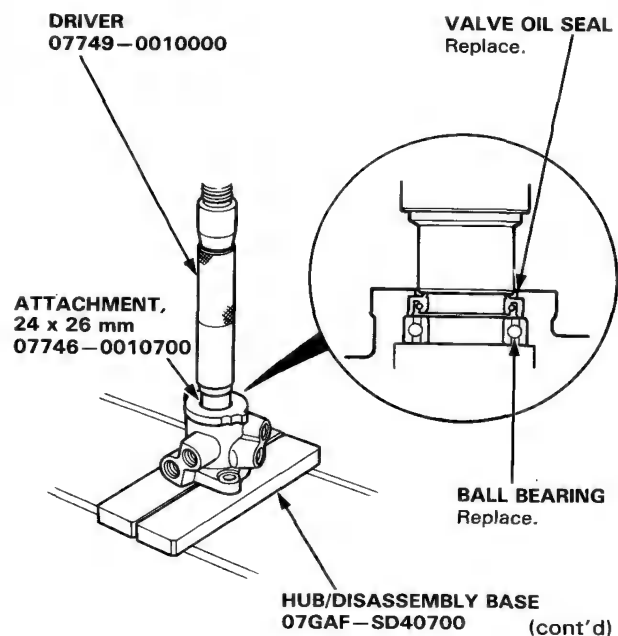
20. Using a cutter or an equivalent tool, cut the valve seal ring and O-ring at the groove in the shaft. Remove the valve seal ring and O-ring.



21. Remove the valve oil seal and spacer from the pinion shaft.



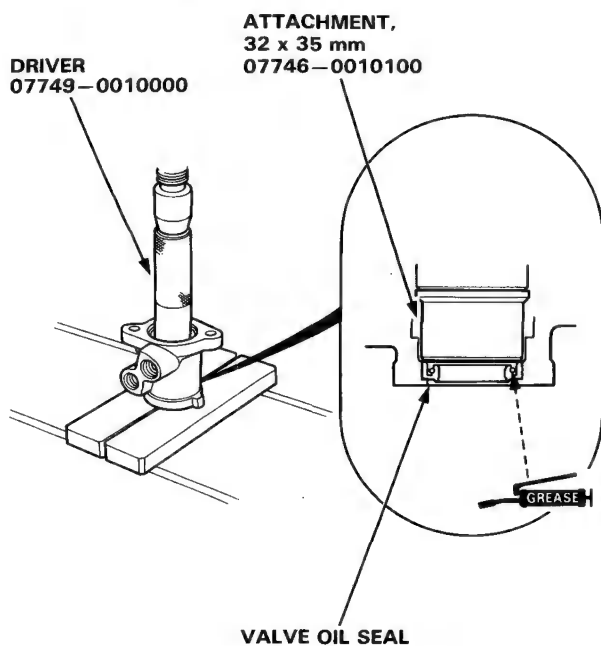
22. Press the valve oil seal and ball bearing out of the valve housing using a hydraulic press and special tools shown below.



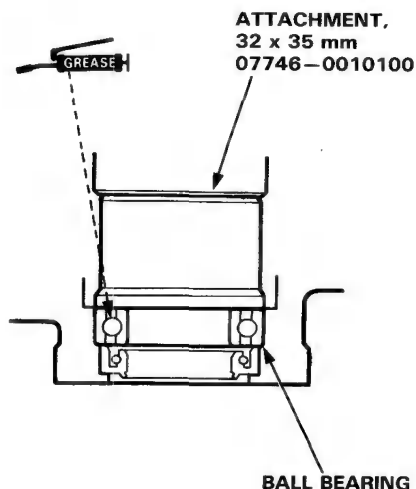
Steering Gearbox (RHD)

Overhaul (cont'd)

23. Grease the sealing lip of the valve oil seal, and install the seal in the valve housing using a hydraulic press and special tools shown below.

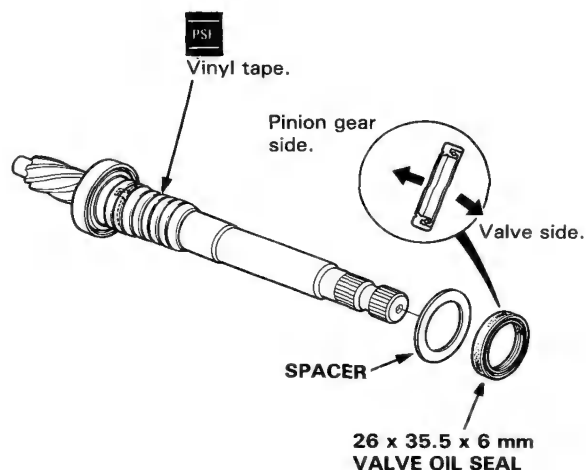


24. Pack a new ball bearing with grease, then press the bearing into the valve housing using a hydraulic press and special tools.



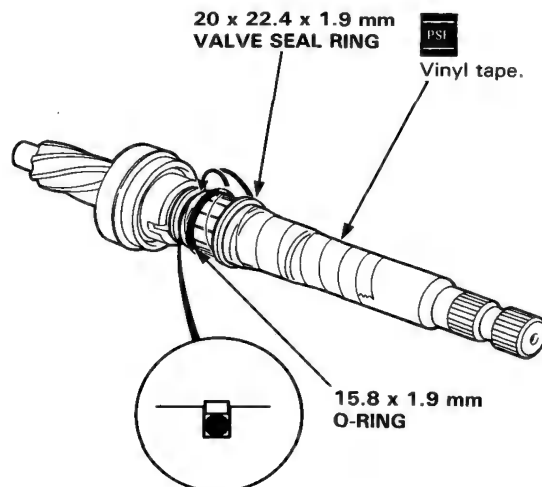
25. Wrap the stepped portion of the pinion shaft with vinyl tape and P/S fluid the surface of the tapy.
26. Slide the spacer and valve oil seal over the pinion shaft, being careful not to damage the sealing lip.

CAUTION: Install the valve oil seal with its groove toward the valve sleeve.



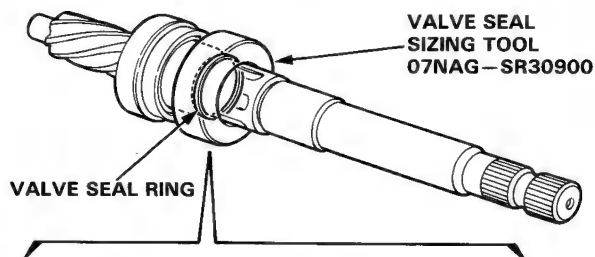
27. Fit the new O-ring in the groove of the pinion shaft. Then slide the new valve seal ring over the shaft and groove on the pinion shaft.

28. Remove the vinyl tape.





29. Apply power steering fluid to the surface of the valve seal ring which was installed on the pinion shaft.
30. Apply power steering fluid to the inside of the special tool, too. Set the larger diameter end of the special tool over the valve seal ring.
31. Move the special tool up and down several times to make the valve seal ring fit in the pinion shaft.
32. Remove the special tool.
33. Set the smaller diameter end of the special tool over the valve seal ring. Move the special tool up and down several times and make the valve seal ring snugly fit in the pinion shaft.

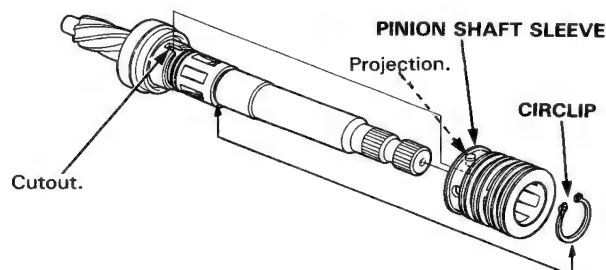


Use a wider diameter end of the special tool first to make the valve seal ring fit in the pinion shaft.

Make the valve seal ring snugly fit in the pinion shaft using another end (smaller diameter end) of the special tool.

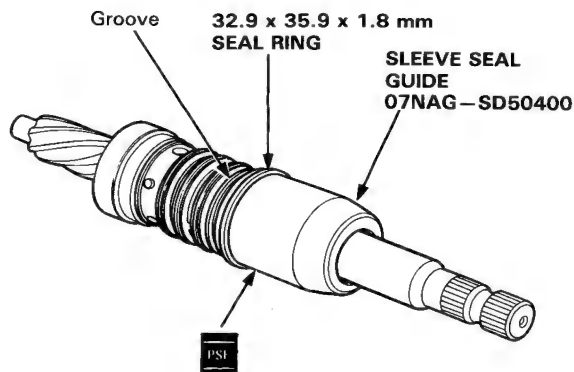
34. Install the pinion shaft sleeve over the pinion shaft and secure it using a circlip.

NOTE: Assemble the pinion shaft sleeve and pinion shaft aligning the projection on the inside of the sleeve with the cutout in the shaft.



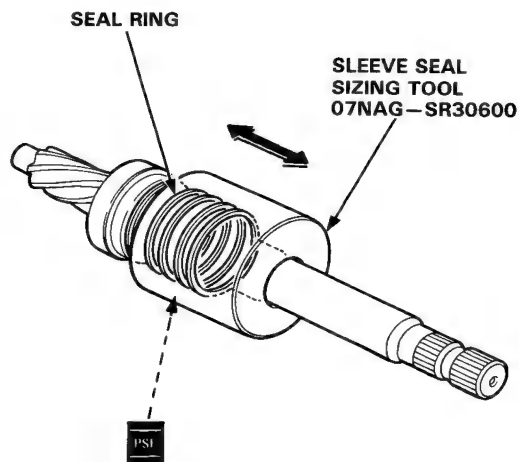
CAUTION: Do not expand the seal ring excessively.

35. Apply power steering fluid to the surface of the special tool. Set the new seal rings (four rings) over the special tool from the smaller diameter end of the tool and expand the seal rings.
36. Set the special tool in the grooves in the sleeve and set each ring in each groove securely.



NOTE: After installation, compress the seal rings with the fingers temporarily.

37. Apply power steering fluid to the seal rings on the sleeve and to the whole internal surface of the special tool.
38. Move the special tool up and down several times to make the seal rings snugly fit in the sleeve.



(cont'd)

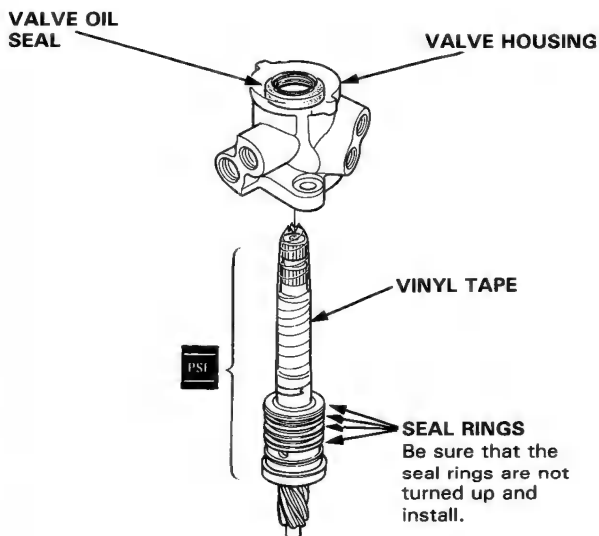
Steering Gearbox (RHD)

Overhaul (cont'd)

CAUTION:

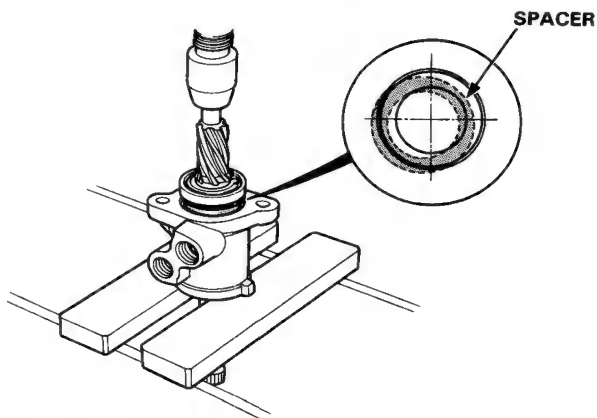
- Install the pinion shaft with care not to damage the valve oil seal lip.
- The seal rings expand outward. Set each ring in the grooves in the sleeve by pushing them with fingers securely and install them in the valve housing.

39. Coat the special tool with power steering fluid and install it on the pinion shaft.
40. Insert the pinion shaft on the valve housing.
41. Remove the special tool from the pinion shaft.



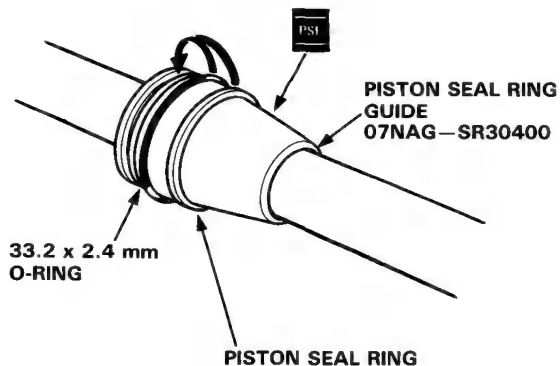
42. Press the pinion shaft using a hydraulic press shown below.

CAUTION: Before inserting the pinion shaft, be sure that the spacer is not off to the side as shown.



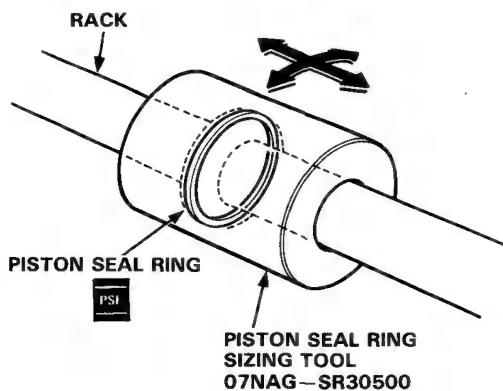
NOTE: Before reassembling any parts inspect them as described on page 17-113 and make sure they are clean. Replace worn or damaged parts.

43. Install a new O-ring on the rack.
44. Coat the piston seal ring guide with power steering fluid, and slide it onto the rack, big end first.
45. Position the new piston seal ring on the special tool, slide it down to big end of the tool, and then pull it off into the piston groove on top of the O-ring.



CAUTION: Do not expand the piston seal ring excessively.

46. Coat the piston seal ring and inside of the special tool with power steering fluid.
47. Carefully slide the tool onto the rack and over the piston ring, then rotate the tool as you move it up and down to seat the piston seal ring.

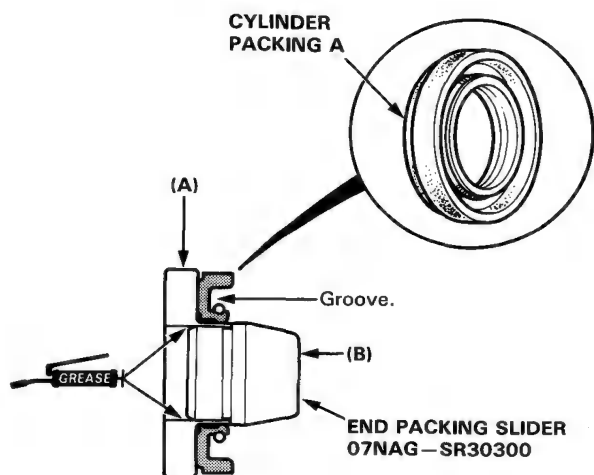




48. Assemble the special tools (A) and (B) and apply a thin coat of grease to the tool surface.

49. Install a new cylinder packing A over the special tool (B).

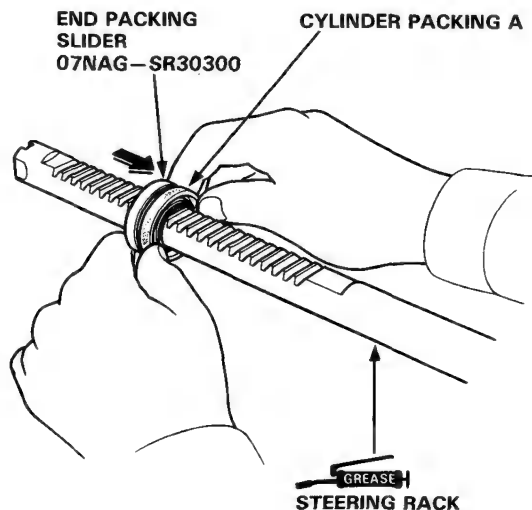
NOTE: Note the installation direction of the cylinder packing A. Install it as shown.



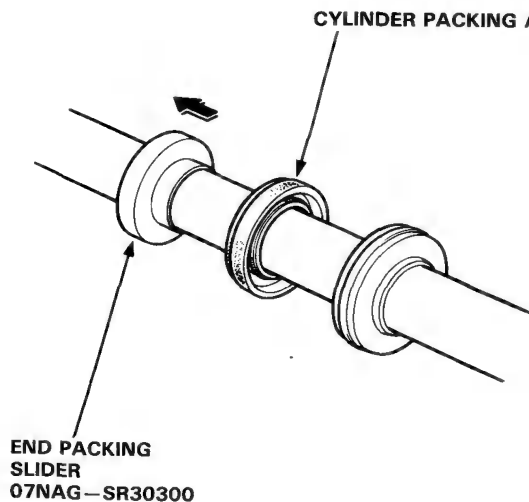
50. Remove the special tool (B) from the special tool (A).

51. Apply a thin coat of grease to the inside of the special tool (A).

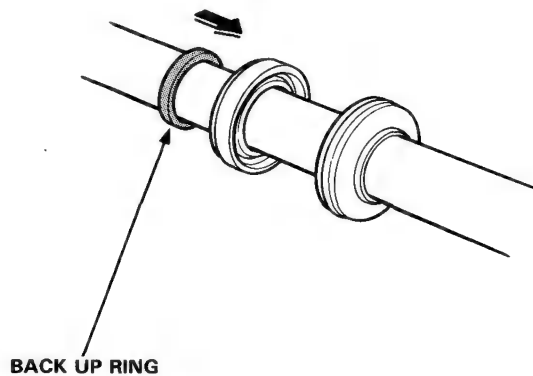
52. Grease the steering rack, and install the special tool.



53. Separate the cylinder end seal from the special tool, then remove the tool from the rack.



54. Install the back up ring on the steering rack.



(cont'd)

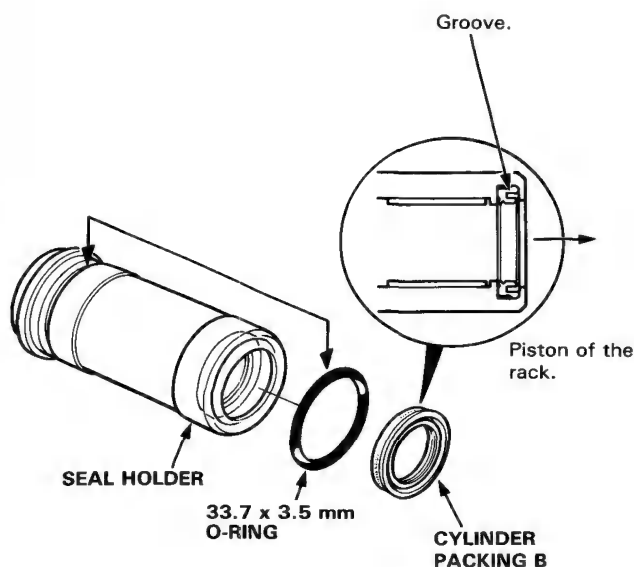
Steering Gearbox (RHD)

Overhaul (cont'd)

55. Coat the inside surface of the seal holder with the power steering fluid, and install the cylinder packing B.

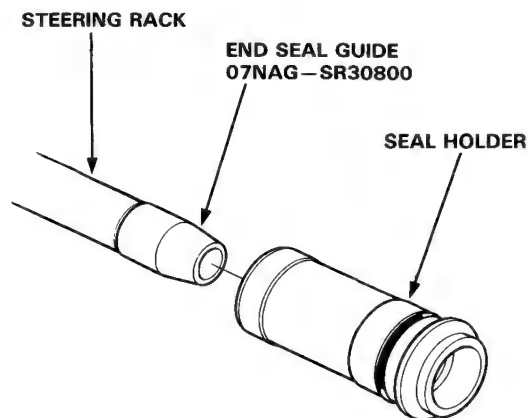
56. Install the O-ring on the groove of the seal holder.

CAUTION: Install the cylinder packing B with its groove toward the piston side of the rack.



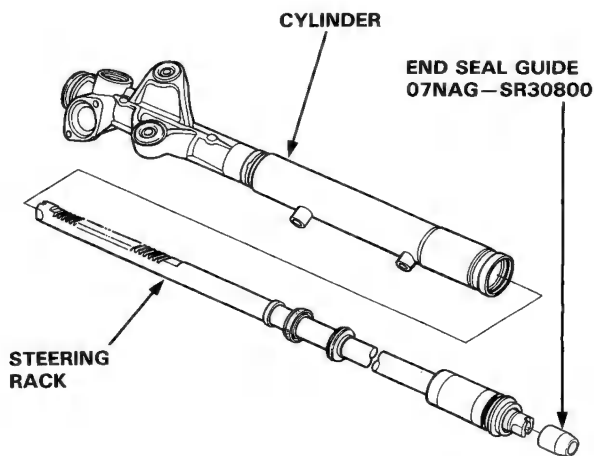
57. Coat the special tool with power steering fluid, and install it on the steering rack.

58. Install the seal holder on the steering rack.



59. Remove the special tool.

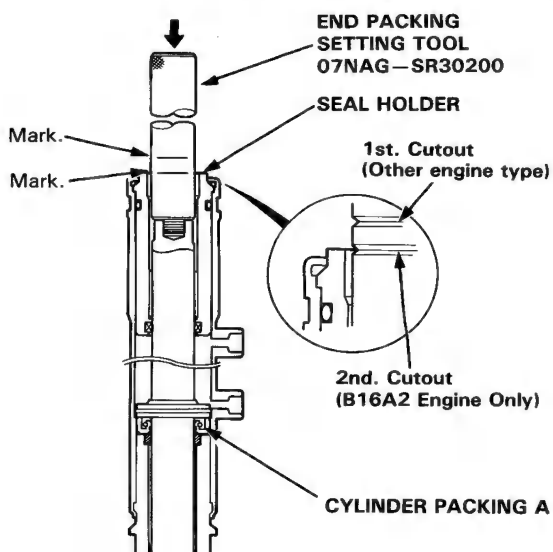
60. Coat the steering rack with power steering fluid, and insert it in the cylinder.



61. Set the cylinder on a press table with the steering rack attached. Install the special tool screwing it into the rack end.

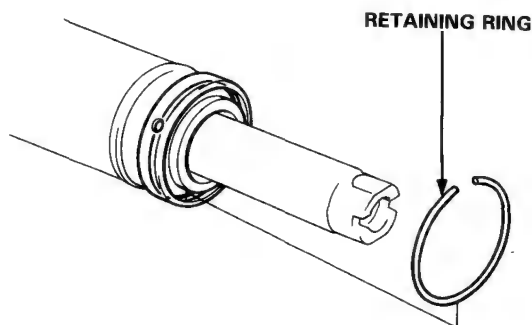
62. Insert the cylinder packing A into the cylinder by pressing on the rack end with the press.

NOTE: Insert the cylinder packing A into the cylinder until the mark on the special tool aligns with the seal holder end. Insert the packing with 150 N (15 kg, 33 lbs) of force.



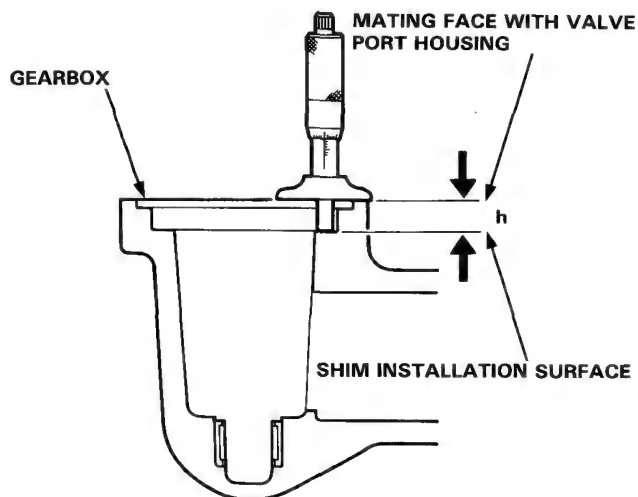


63. Install the retaining ring on the cylinder.

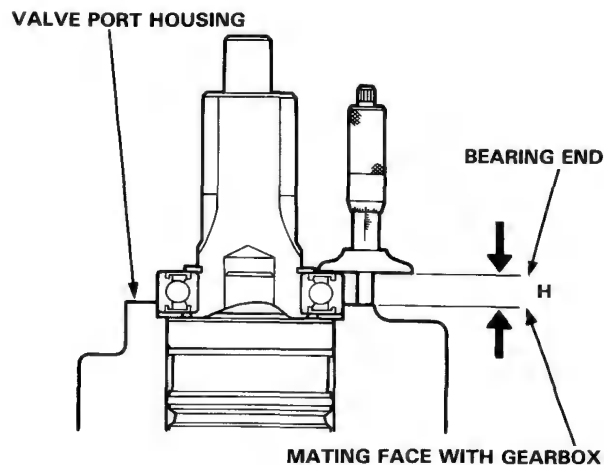


64. Adjust number of the shims (7 shims, thickness: 0.05 mm/0.002 in) before installing the control valve unit on the gearbox.

1) Measure the depth "h" from the mating surface of the gearbox/valve port housing to the shim installation surface.



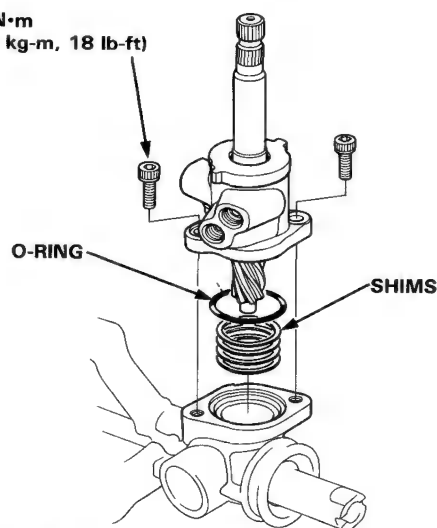
2) Measure the height "H" from the mating surface of the control valve unit/gearbox to the bearing end.



3) Adjust number of the shims so that the difference between the measurements "h" and "H" is 0.05 mm (0.002 in) or below.

65. Install the shims and O-ring on the gear housing. Install the control valve unit on the gear housing.

25 N·m
(2.5 kg-m, 18 lb-ft)



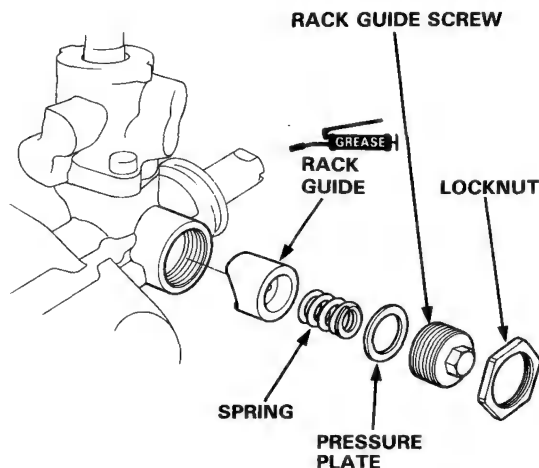
NOTE: Be sure to apply the liquid gasket to the mating face evenly (0.5—1.5 g/0.018—0.053 oz) not to let it to drop inside the housing.

(cont'd)

Steering Gearbox (RHD)

Overhaul (cont'd)

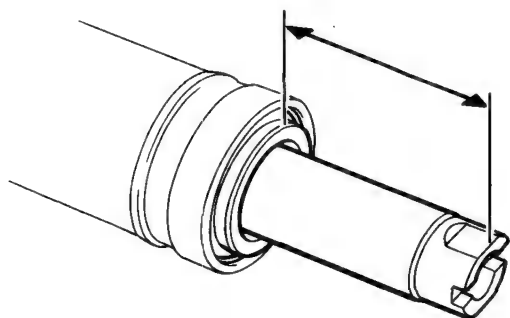
66. Install the rack guide screw.
67. Coat the rack guide with grease.
68. Install the spring, pressure plate and rack guide screw on the gear housing.



NOTE: Adjust the rack guide at the center of the rack stroke.

69. Values for the cylinder side are listed below.

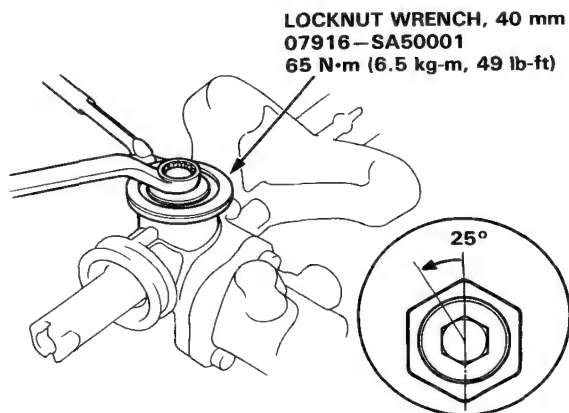
B16A2 Engine : 59.1 mm (2.33 in)
Other engines: 64.3 mm (2.53 in)



70. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.

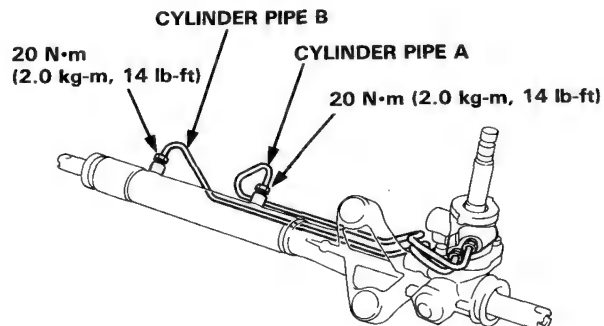
71. Retighten it to 5 N·m (0.5 kg-m, 3.6 lb-ft), back it off about 25° then install the locknut on the rack guide screw.

72. Tighten the locknut while holding the rack guide screw with the special tool.



NOTE: After adjustment, be sure that the pinion torque is 0.7–1.2 N·m (7–12 kg-cm, 6.07–10.41 in-lb) when the pinion angle is within 90° right and left, and it is 1.3 N·m (13 kg-cm, 11.28 in-lb) or below when the pinion angle is outside the above specification.

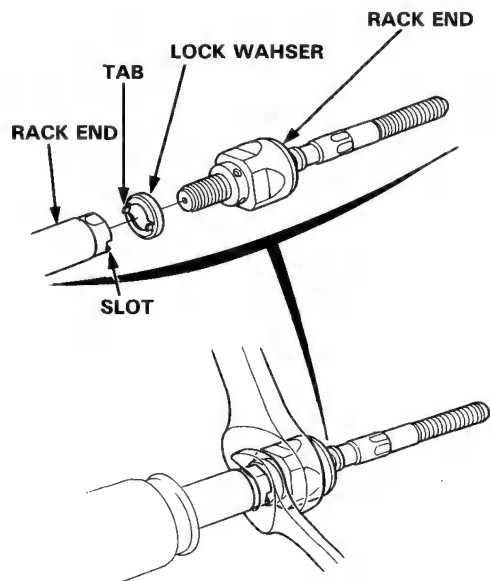
73. Install the cylinder pipes A and B.





74. Install the new lock washer in the groove in the steering rack.

75. Hold the steering rack with a wrench and tighten the rack end to 55 N·m (5.5 kg-m, 40 lb-ft).

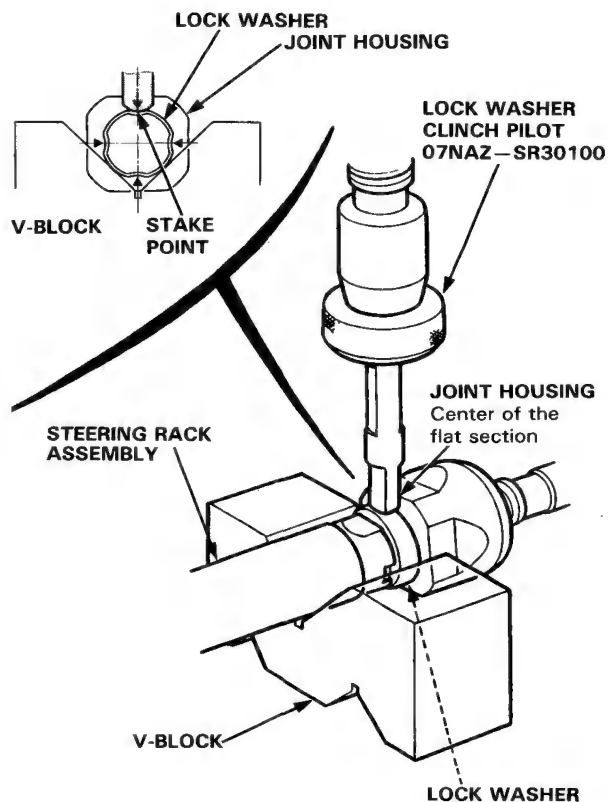


76. After tightening the rack end, stake the four section of lock washer with the special tool and hydraulic press.

NOTE: Set the V-block on the press table. Set the lock washer section of the rack end on the V-block securely.

- Be sure that the pressing direction, special tool, and each lock washer stake position are in line.
- Stake the lock washer in the center of the flat section of the joint housing. (The bottom end of the stake must be in that position.) See below.

STAKE POINT "▼"



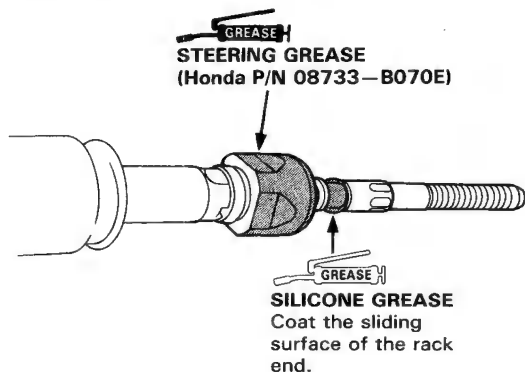
(cont'd)

Steering Gearbox (RHD)

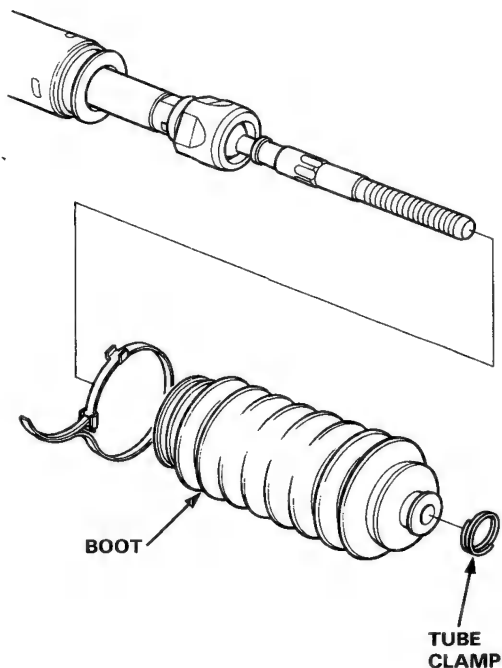
Overhaul (cont'd)

77. Apply steering grease to the circumference of the rack end housing.

NOTE: Coat the rack end groove and inside of the boot with silicone grease.



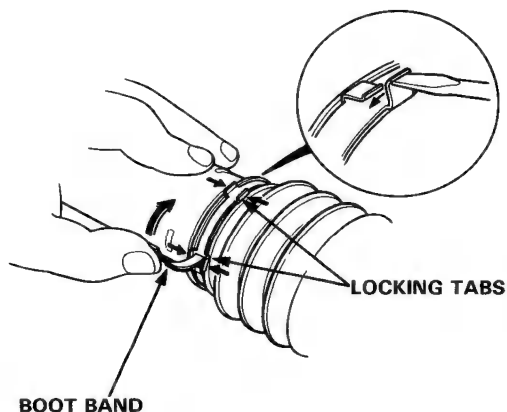
78. Install the boots on the rack end with the tube clamps.



NOTE: Install the boot band with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).

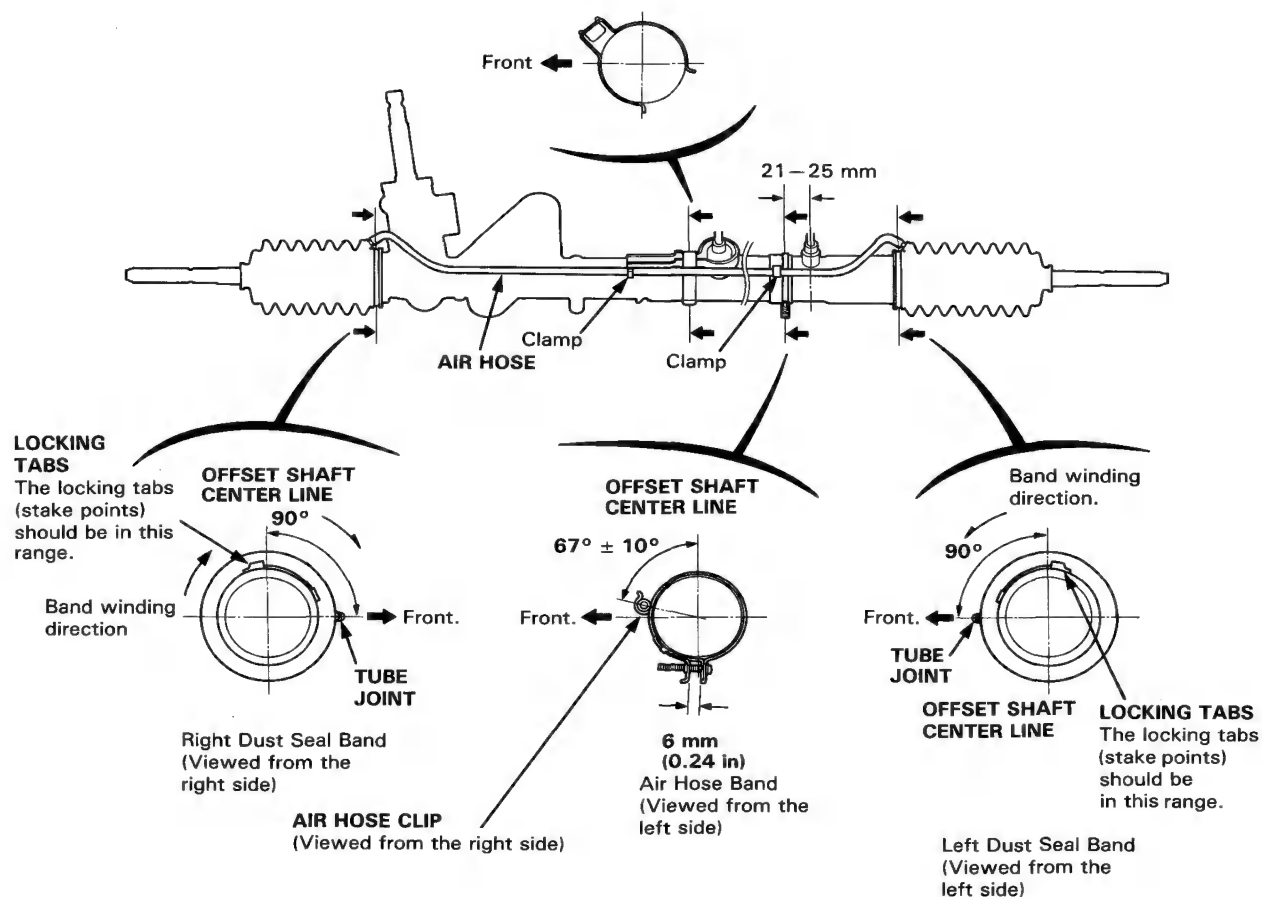
79. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)
80. Install new boot bands on the boot and bend both sets of locking tabs.
81. Lightly tap on the doubled-over portions to reduce their height.

CAUTION: Stake the band locking tabs firmly.





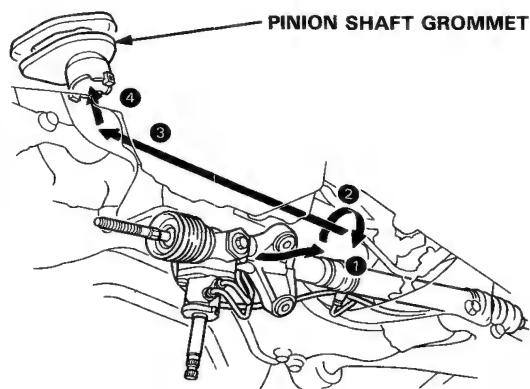
82. Install the band cushion and air hose band; position the band as shown and tighten it. Then install the air hose.
83. After assembling, slide the rack right and left to be certain that the boots are not deformed or twisted.
84. Install the right and left tie-rods on the right and left rack ends.



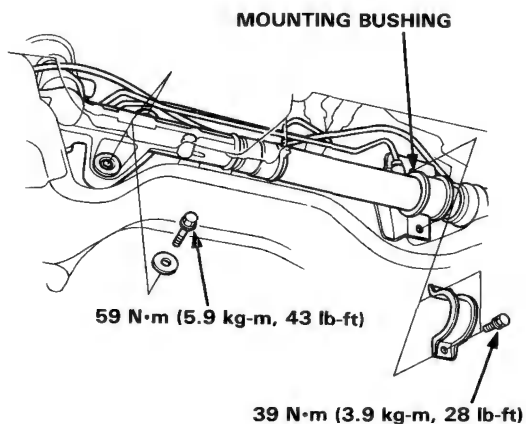
Steering Gearbox

Installation

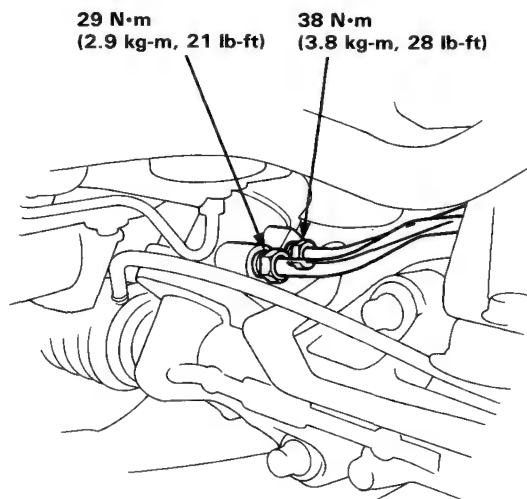
1. Slide the rack all the way to the left.
2. Pass the left side of the steering gearbox assembly above and through the left side of the rear beam.
3. Hold steering gearbox assembly and slide the rack all the way to the left.
4. Raise the right side of the steering gearbox assembly above and through the right side of the rear beam.
5. Install the pinion shaft grommet and insert the pinion shaft up through the bulkhead.



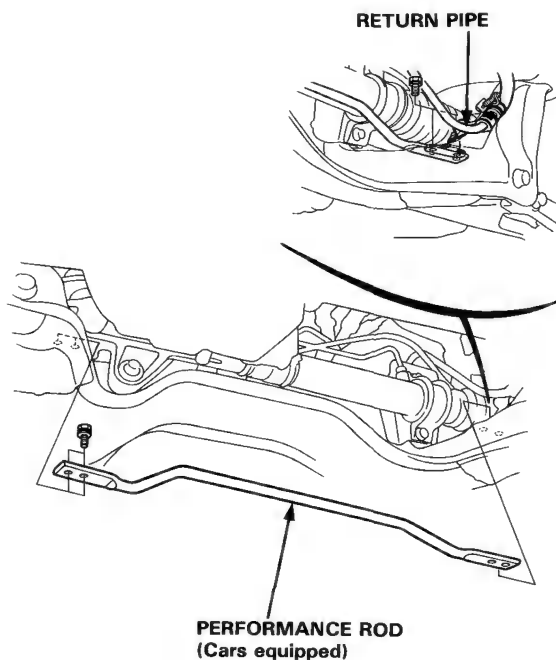
6. Install and tighten the gearbox mounting bolts.



7. Connect the fluid lines to the control unit.



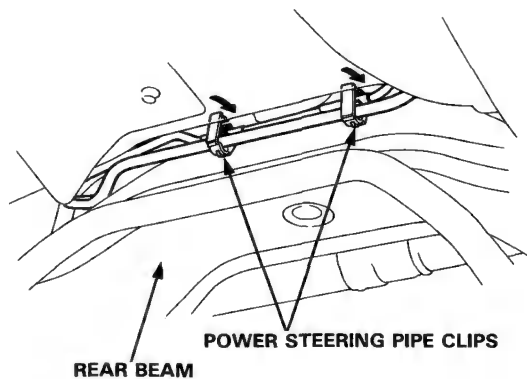
8. Install the performance rod on the rear beam, if it is equipped.



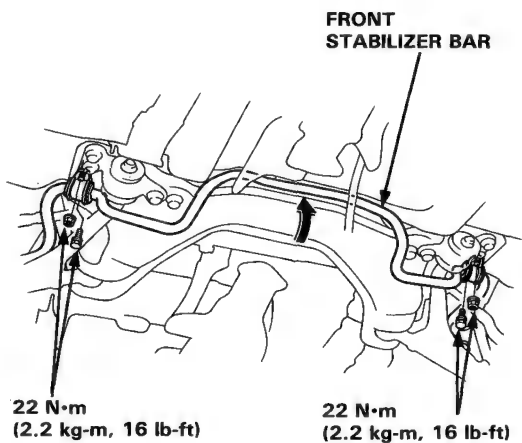


9. Secure the two pipes with the pipe clips in the top of the rear beam.

NOTE: After installation of the pipes, check them for bend, interference with the adjacent parts, and other abnormalities.

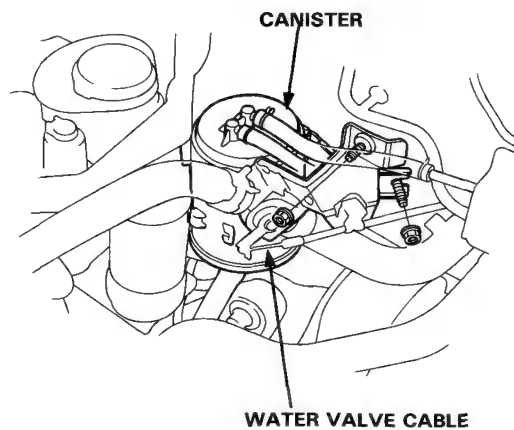


10. Install the front stabilizer in its original position.

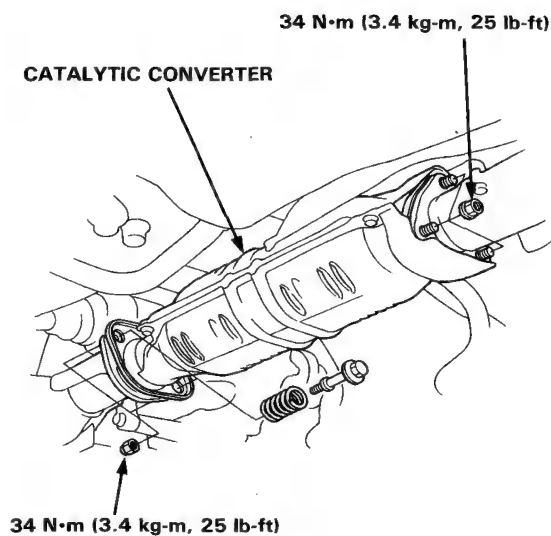


11. Install the water valve and connect the cable.

12. Install the canister.



13. Install the catalytic converter with the new gaskets and self-locking nuts.

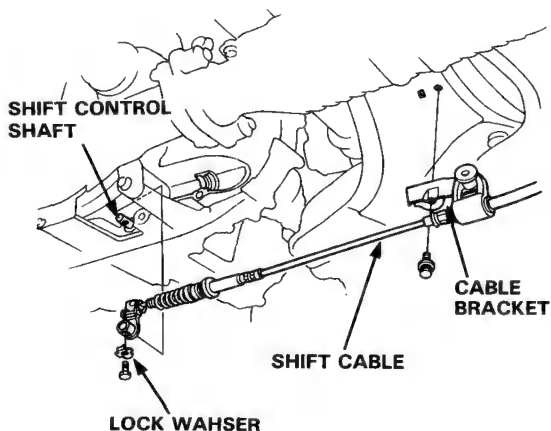


Steering Gearbox (RHD)

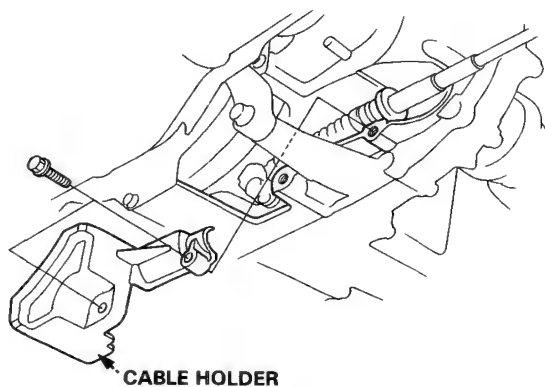
Installation (cont'd)

(Automatic transmission model only)

- Connect the shift cable end to the shift control shaft, and install the cable bracket.

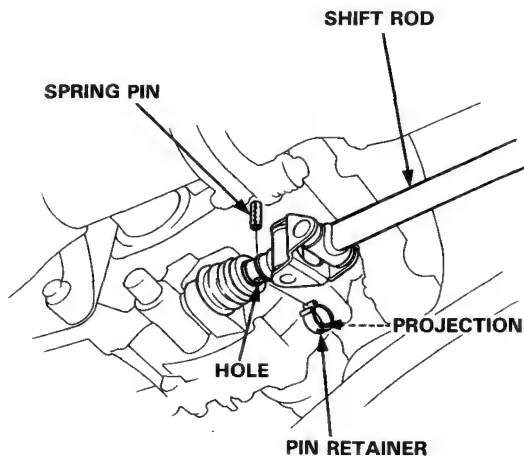


- Install the cable holder.

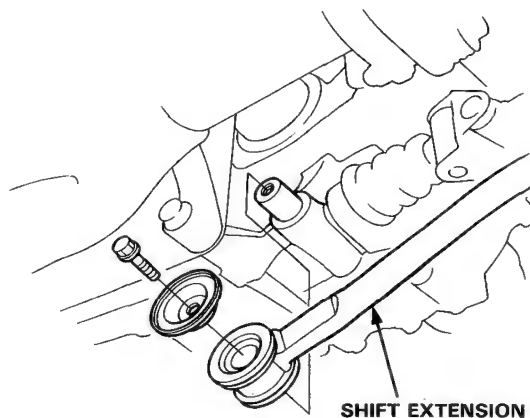


(Manual transmission model only)

- Connect the shift rod to the transmission and drive the spring pin with a punch, then install the pin retainer. Be sure that the projection on the pin retainer is in the hole.



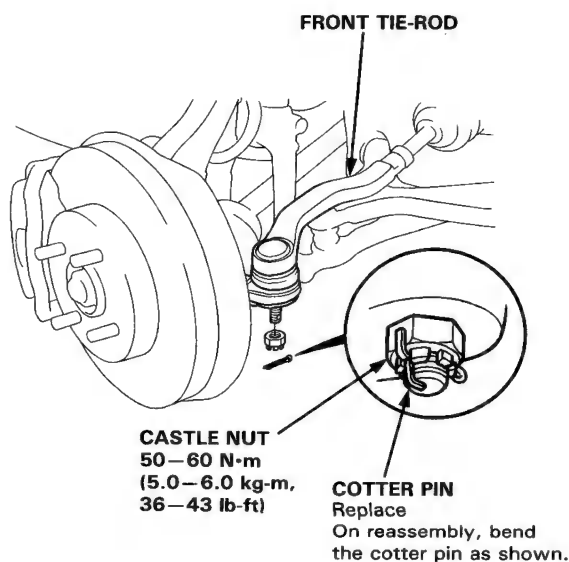
- Install the shift extension on the transmission case.





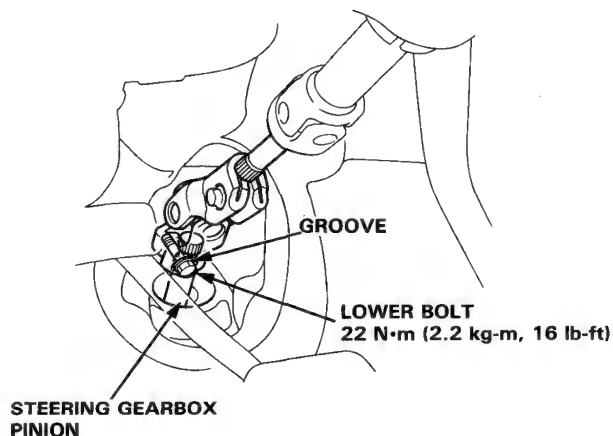
14. Reconnect the tie-rods to the steering knuckles, tighten the ball joint nut to the specified torque, and install new cotter pins.

CAUTION: Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the slot by loosening.

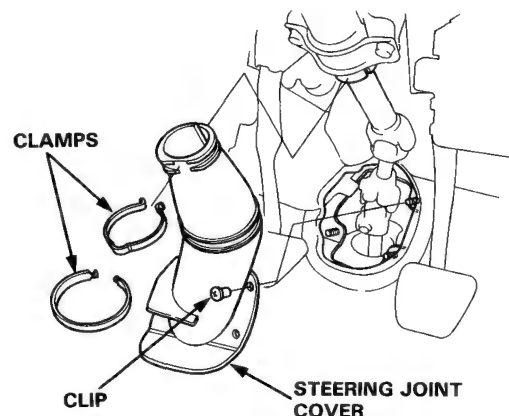


15. Reconnect the steering shaft to the gearbox.

CAUTION: Before tightening the steering joint bolts pull the steering joint to make sure that the steering joint is fully seated.



16. Install the steering joint cover with the clamps and clip.



17. Fill the system:

- Fill the reservoir with new Honda Power Steering Fluid-V.
- Connect the battery positive terminal and then connect the negative terminal.

18. After installation, perform the following checks.

- Start the engine and let it run at fast idle, then turn the steering wheel from lock-to-lock several times to bleed air from the system.
- Check the fluid again, and add more if necessary.
- Check the gearbox for leaks.
- Check the front toe.
- Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

NOTE: Turn the right and left tie-rods equally.

Ball Joint Boot

Replacement

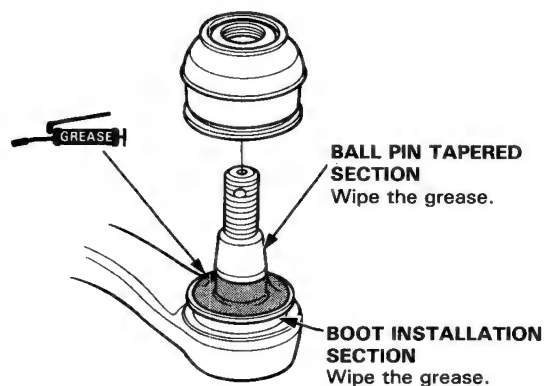
1. Remove the circlip and the boot.

CAUTION: Do not contaminate the boot installation section with grease.

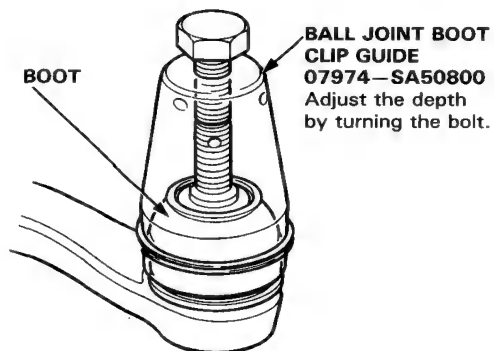
2. Pack the interior of the boot and lip with grease.
3. Wipe the grease off the sliding surface of the ball pin, then pack the lower area with fresh grease.

CAUTION:

- Keep grease off the boot installation section and the tapered section of the ball pin.
- Do not allow dust, dirt or other foreign materials to enter the boot.



4. Install the boot in the groove of the boot installation section securely, then bleed air.



CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

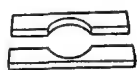
Suspension

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Special Tools (2WD/4WD)

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	✓07GAF—SD40700	Hub Dis/Assembly Base	2	18-14
②	✓07GAF—SE00200	Hub Dis/Assembly Guide Attachment	1	18-16
③	✓07GAF—SE00401	Hub Dis/Assembly Base	1	18-14
④	✓07GAG—SD40700	Ball Joint Boot Clip Guide	1	18-19
⑤	✓07HAD—SF10100	Driver Attachment	1	18-15
⑥	✓07HGK—0010101	Wheel Alignment Gauge Attachment	1	18-15
⑦	✓07JAF—SH20110	Hub Dis/Assembly Pilot, 38 mm	1	18-14, 15, 16
⑧	✓07JAF—SH20120	Hub Dis/Assembly Shaft, 22.4 x 25.4 mm	1	18-14, 15, 16
⑨	✓07JAF—SH20200	Ball Joint Remover Base	1	18-18
⑩	✓07MAC—SL00200	Ball Joint Remover, 28 mm	1	18-12, 13
⑪	✓07746—0010500	Attachment, 62 x 68 mm	1	18-14
⑫	✓07746—0010600	Attachment, 72 x 75 mm	1	18-15
⑬	✓07749—0010000	Driver	1	18-14, 15, 16, 35, 36
⑭	✓07965—SB00100	Ball Joint Remover/Installer	1	18-18
⑮	✓07965—SB00200	Ball Joint Installer Base	1	18-18
⑯	✓07965—SD90100	Support Base	1	18-15, 16
⑰	✓07974—SA50700	Ball Joint Boot Clip Guide	1	18-18, 19



①



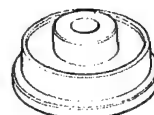
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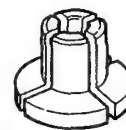
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④ ⑰



⑤



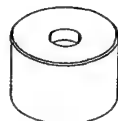
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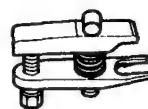
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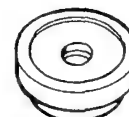
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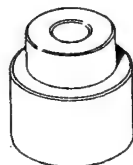
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⑪ ⑫



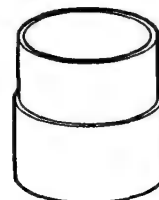
⑬



⑭



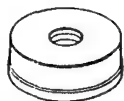
⑮



⑯



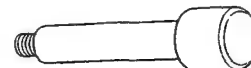
Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	✓ 07746-0010400	Attachment, 52 x 55 mm	1	18-35
②	✓ 07947-6340400	Attachment	1	18-36
③	✓ 07965-SA50500	Dis/Assembly Tool E	1	18-36
④	✓ 07965-SA70100	Hub Dis/Assembly Tool	1	18-35
⑤	✓ 07965-6340301	Hub Dis/Assembly Base	1	18-35
⑥	✓ 07965-6920201	Hub Dis/Assembly Tool B	1	18-36



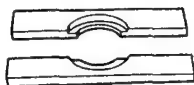
① ②



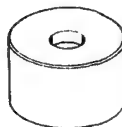
③



④



⑤



⑥

Component Location

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⚠ WARNING

The front and rear dampers contain nitrogen gas and oil under pressure. The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.

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- Disposal, page 13-45

FRONT UPPER ARM

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STABILIZER BAR

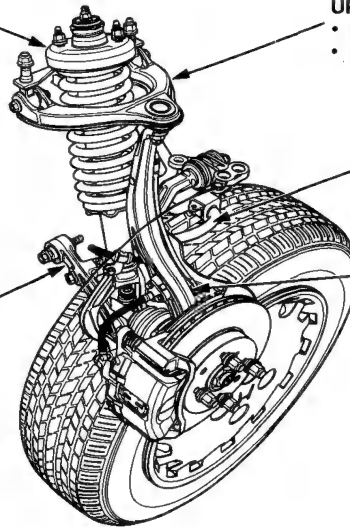
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4WD:

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REAR LOWER ARM

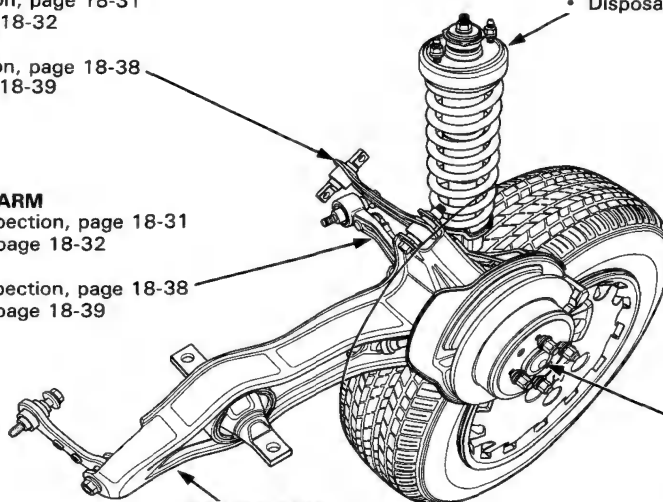
- Removal/Inspection, page 18-31
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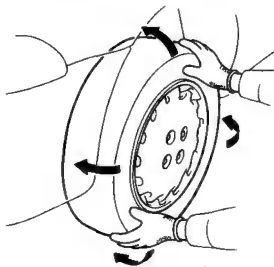
Wheel Alignment



Caster

NOTE: For proper inspection/adjustment of the wheel alignment, check and adjust the following before checking the alignment.

- Check that the suspension is not modified.
- Check the tire size and tire pressure.
- Check the runout of the wheels and tires.
- Check the suspension ball joints. (Hold a wheel with your hands and move it up and down and right and left to check for wobbling.)



Inspection

1. Check the steering wheel angle; If significantly off center, it may be necessary to remove the steering wheel and reposition it on the splines. Turn the steering wheel to the straight-ahead position.

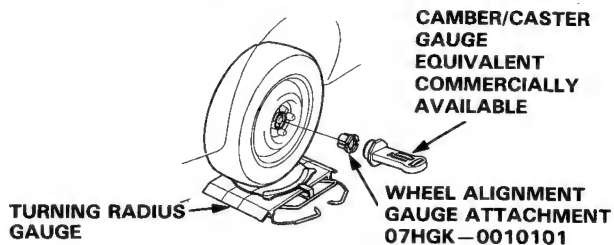
2. Install the special tools on the wheels.

NOTE: Make sure the wheel hubs are clean and rustfree before installing the special tools.

3. Install a camber/caster gauge on the special tool and apply the front brake. Turn the wheel 20° inward.
4. Turn the adjust screw so that the bubble in the caster gauge is at 0°.
5. Turn the wheel outward 20° and read the caster on the gauge with the bubble at the center of the gauge.

Caster Angle: $1^{\circ}10' \pm 1^{\circ}$

6. If out of specification, check for bent or damaged suspension components.



Camber

Inspection

1. Check the steering wheel angle. If significantly off center, it may be necessary to remove the steering wheel and reposition it on the splines. Turn the steering wheel to the straight-ahead position.

2. Install the special tools on the wheels.

NOTE: Make sure the wheel hubs are clean and rustfree before installing the special tools.

3. Read the camber on the gauge with the bubble at the center of the gauge.

Camber angle:

Front: $0^{\circ}00' \pm 1^{\circ}$

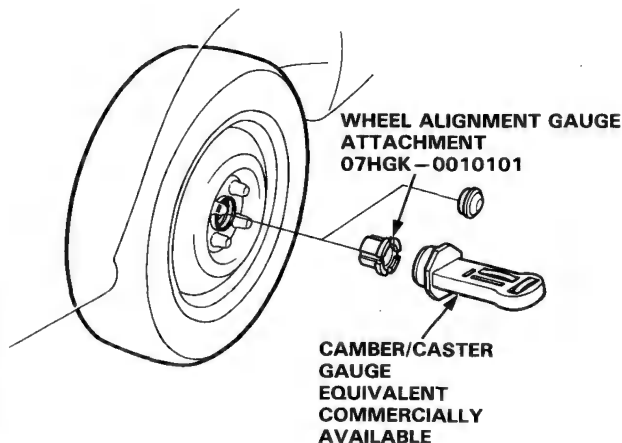
$-0^{\circ}10' \pm 1^{\circ}$ (B16A2 engine)

$0^{\circ}10' \pm 1^{\circ}$ (4WD)

Rear: $-0^{\circ}20' \pm 1^{\circ}$

$-0^{\circ}25' \pm 1^{\circ}$ (B16A2 engine and 4WD)

4. If out of specification, check for bent or damaged suspension components.



Wheel Alignment

Front Toe Inspection/Adjustment

1. Check the tire pressure.
2. Center steering wheel spokes.
3. Check the toe with the wheels pointed straight ahead.

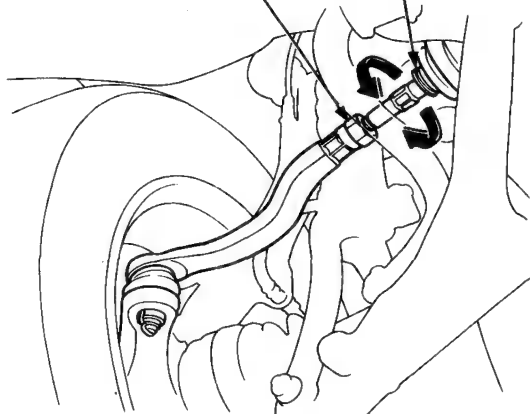
Front toe-in: 0 ± 2 mm

- If adjustment is required, go on to step 4.
 - If no adjustment is required, remove alignment equipment.
4. Loosen the tie-rod locknuts and turn both tie-rods in the same direction until the front wheels are in straight ahead position.
 5. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
 6. After adjusting, tighten the tie-rod locknuts.

NOTE: Reposition the tie-rod boot if it is twisted or displaced.

TIE-ROD LOCKNUT
14 x 1.5 mm
55 N·m (5.5 kg-m, 40 lb-ft)

TIE-ROD



Rear Toe Inspection/Adjustment

1. Release parking brake.

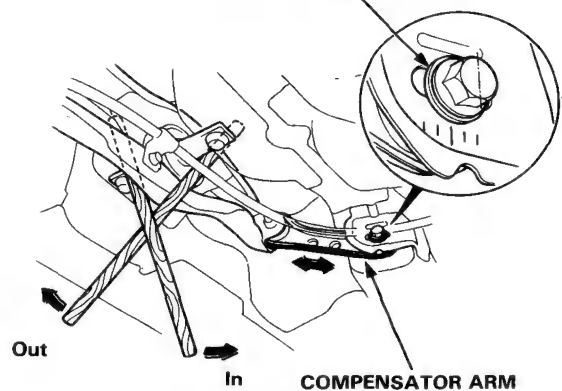
NOTE:

- Measure difference in toe measurements with the wheels pointed straight ahead.
- If the parking brake is engaged, you may get an incorrect reading.

Rear toe-in: $2 \begin{smallmatrix} +2 \\ -1 \end{smallmatrix}$ mm
 $0 \begin{smallmatrix} +1 \\ -2 \end{smallmatrix}$ mm (INTRAC)

- If adjustment is required, go to step 2.
 - If no adjustment is required, remove alignment equipment.
2. Before adjustment, note the locations of right and left compensator arm adjusting bolts.
 3. Loosen the adjusting bolt and slide the compensator arm in or out as shown, to adjust the toe.
 4. Tighten the adjusting bolt.

**COMPENSATOR ARM
ADJUSTING BOLT**
65 N·m (6.5 kg-m, 47 lb-ft)



● **Example**

- After the rear toe inspection, the wheel is 2 mm (0.079 in) out of the specification.
- Move the arm so the adjusting bolt moves 2 mm (0.079 in) inward from the position recorded before the adjustment.
 - The distance the adjusting bolt is moved should be equal to the amount out-of-specification.



Turning Angle Inspection/Adjustment

1. Jack up the front of the car. Set the turning radius gauges beneath the front wheels, then lower the car.
2. Jack up the rear of the car. Place boards that are the same thickness as the turning radius gauges under the rear wheels, then lower the car.

NOTE: For accurate readings, the car must be level.

3. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

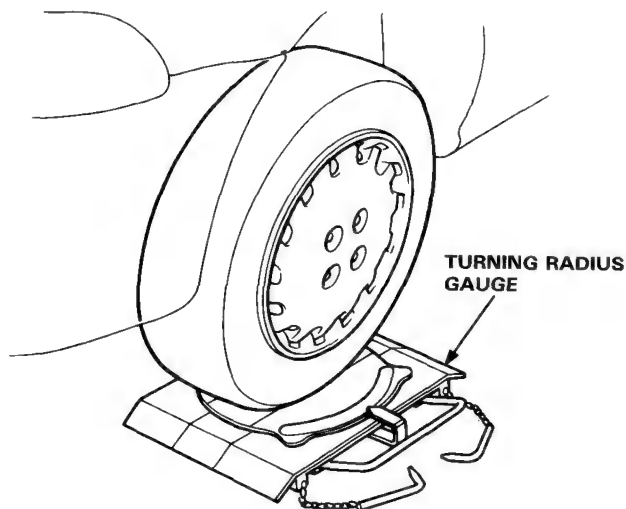
Turning angle:

Inward wheel: $41^{\circ}00' \pm 2^{\circ}$

$36^{\circ}00' \pm 2^{\circ}$ (B16A2 engine)

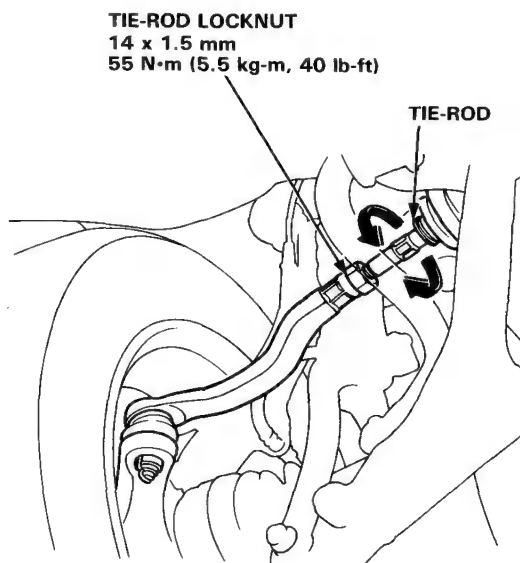
Outward wheel: $33^{\circ}30'$

$30^{\circ}30'$ (B16A2 engine)



4. If the measurements are not within the specifications, adjust as required by turning the tie-rods.

NOTE: After adjusting, recheck the front wheel toe and readjust if necessary. Reposition the tie-rod boot if twisted or displaced.

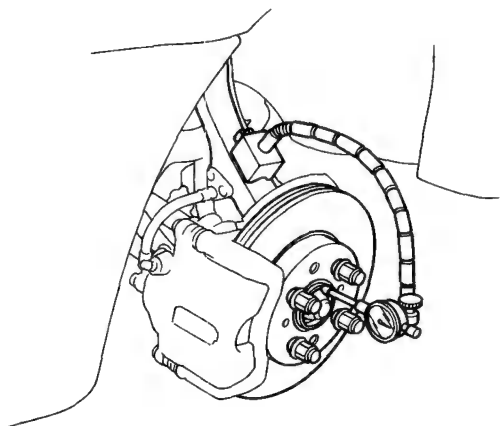


Wheel Measurements

Bearing End Play

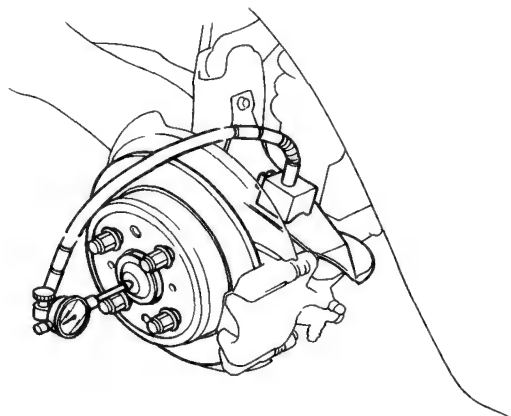
Front Wheel End Play

Standard: 0—0.05 mm (0—0.002 in)



Rear Wheel End Play

Standard: 0—0.05 mm (0—0.002 in)



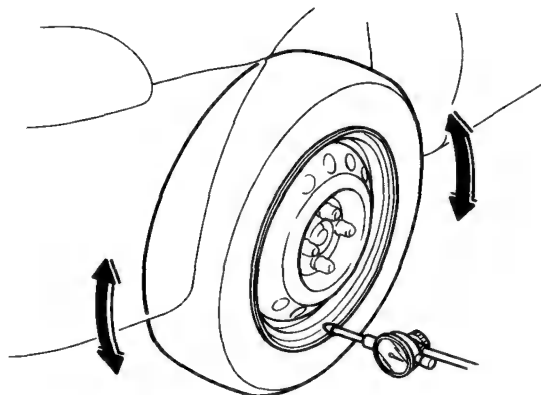
Runout

Front and Rear Wheel Radial Runout

Standard:

Steel Wheel: 0—1.0 mm (0—0.039 in)

Aluminum Wheel: 0—0.7 mm (0—0.028 in)

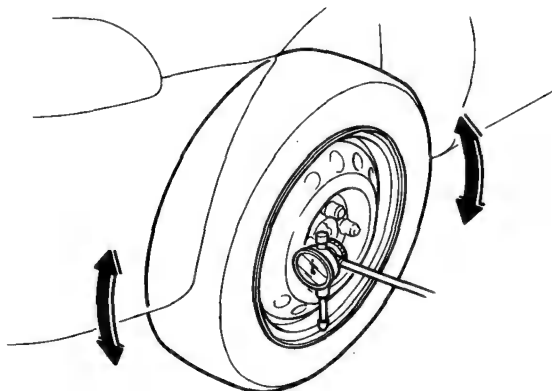


Front and Rear Wheel Axial Runout

Standard:

Steel Wheel: 0—1.0 mm (0—0.039 in)

Aluminum Wheel: 0—0.7 mm (0—0.028 in)



Front Suspension

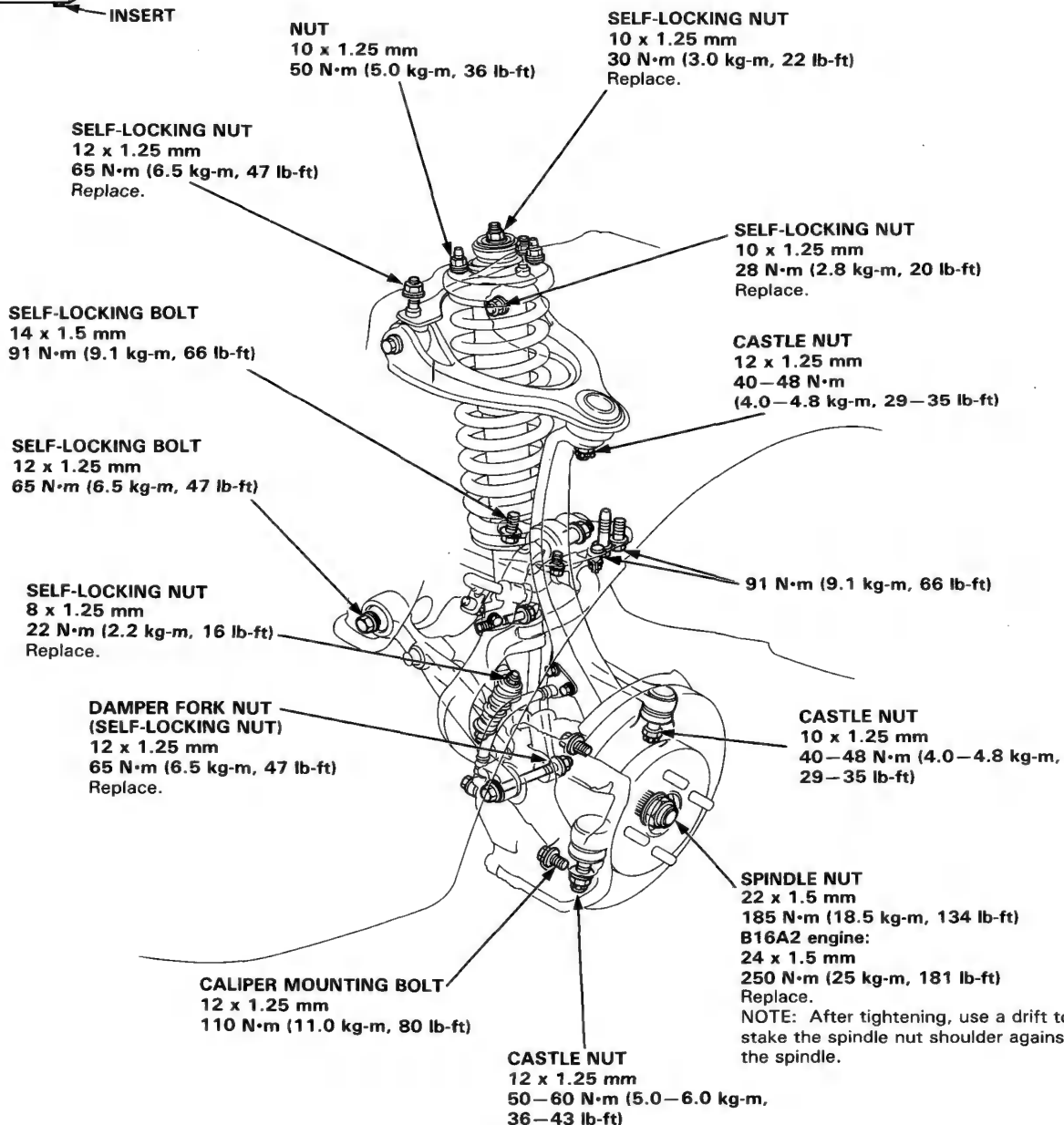
Torque Specifications



CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing are tightened.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

NOTE: Wipe off the grease before tightening the nut at the ball joint.



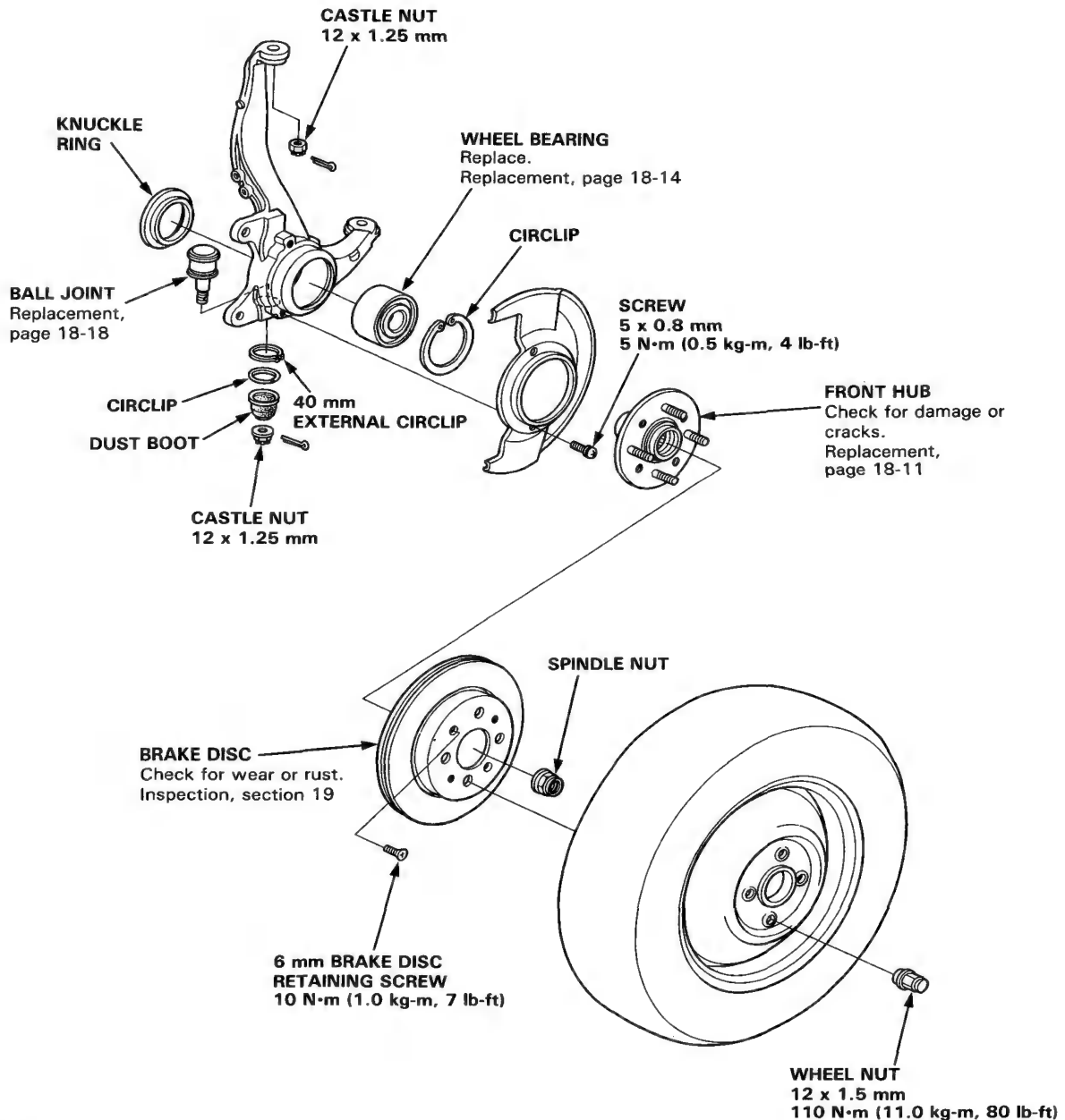
Front Suspension

Knuckle/Hub

Illustrated Index

NOTE:

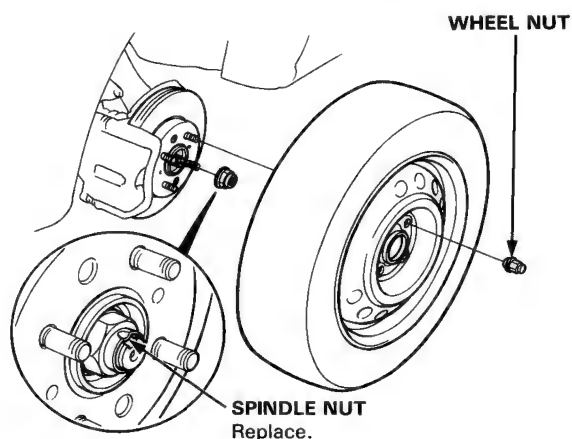
- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- Remove the center cap by prying it out with a flat screwdriver. Use a rag at the point you are going to pry because aluminum alloy wheels can be easily damaged. Avoid damage to the cap by not allowing it to fall during removal.
- Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.





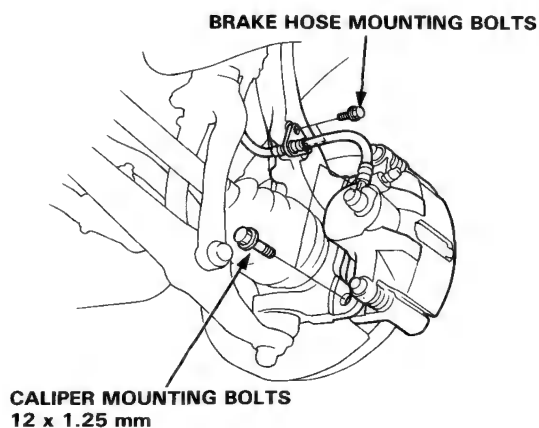
Removal

1. Loosen the wheel nuts slightly.
2. Raise the front of car and support on safety stands in proper locations.
3. Remove the wheel nuts and wheel.
4. Raise the locking tab on the spindle nut, then remove the nut.



5. Remove the mounting bolts for the brake hose bracket.
6. Remove the caliper mounting bolts and hang the caliper assembly to one side.

CAUTION: To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper assembly from the undercarriage.

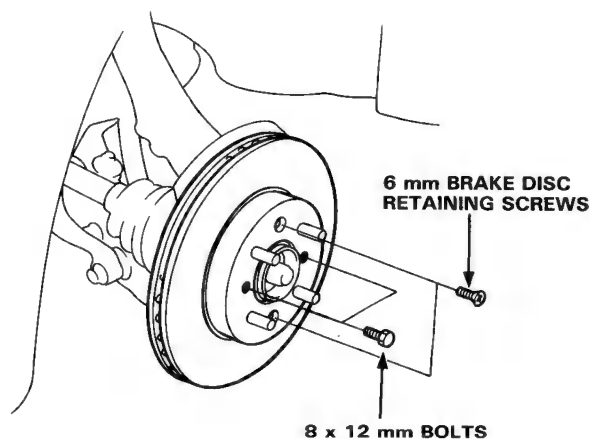


7. Remove the 6 mm brake disc retaining screws.

8. Screw two 8 x 12 mm bolts into the disc to push it away from the hub.

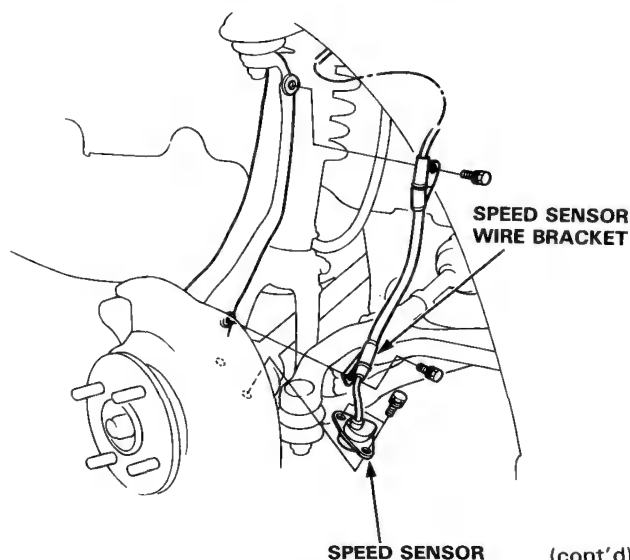
NOTE: Turn each bolt two turns at a time to prevent cocking the disc excessively.

9. Remove the brake disc from the knuckle.



10. Remove the speed sensor wire bracket, then remove the speed sensor from the knuckle.

NOTE: Do not disconnect the speed sensor.



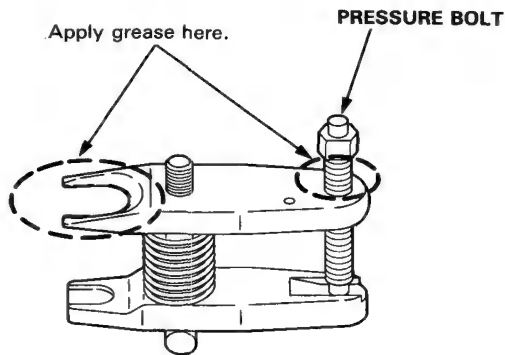
Front Suspension

Knuckle/Hub (cont'd)

NOTE: Use the ball joint remover, 07MAC—SL00200 (28 mm), to separate the ball joints from the suspension or steering arm.

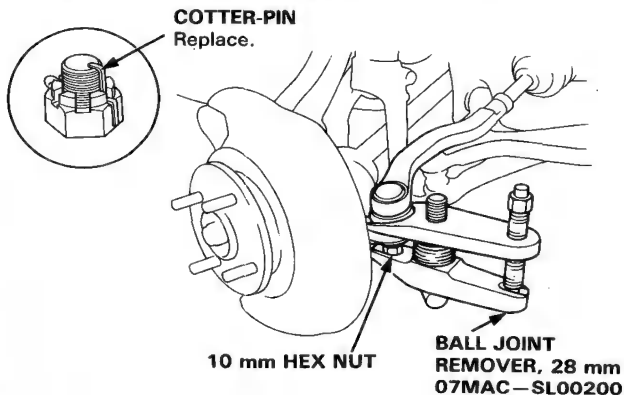
CAUTION: Be careful not to damage the ball joint boot.

11. Clean any dirt or grease off the ball joint.
12. Remove the cotter pin from the steering arm and remove the nut.
13. Apply grease to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt threads.

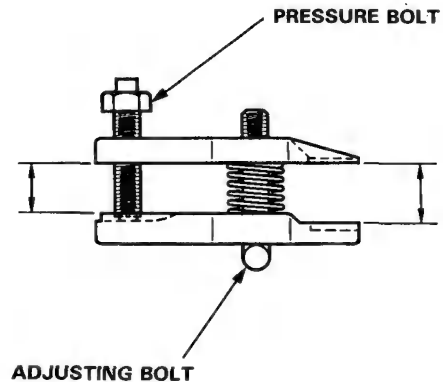


14. Install a 10 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end to prevent damage to the threaded end of the ball joint.
15. Use the ball joint remover, 07MAC—SL00200 (28 mm), as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.

NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



16. Once the tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt and recheck the jaws to make sure they are still parallel.



17. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

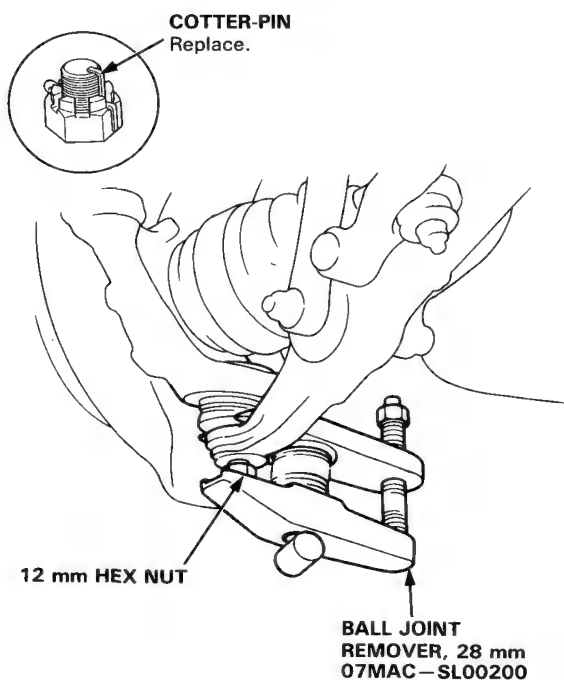
⚠ WARNING Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris in your eyes.

18. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot and replace it if damaged.



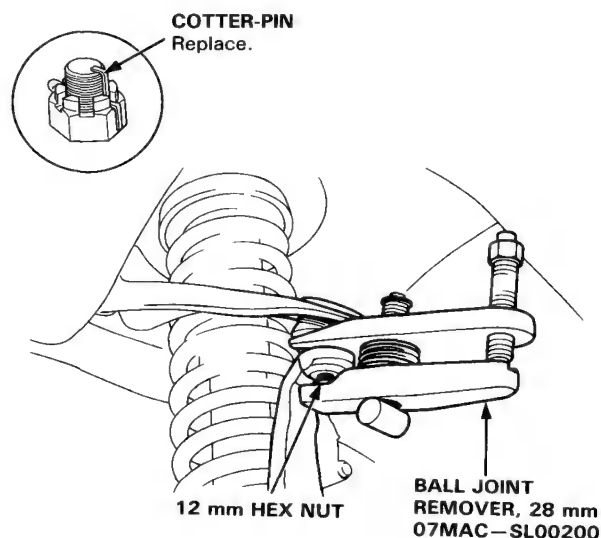
19. Remove the cotter pin and lower arm ball joint nut.
20. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
21. Use the ball joint remover, 07MAC—SL00200 (28 mm), as shown on page 18-12 to separate the ball joint and lower arm.

NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

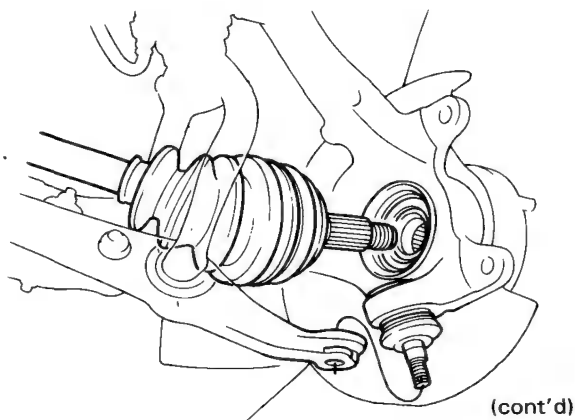


22. Remove the knuckle protector.
23. Remove the cotter pin and the upper ball joint nut.
24. Install the 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
25. Use the ball joint remover, 07MAC—SL00200 (28 mm), as shown on page 18-12 to separate the ball joint and knuckle.

NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



26. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle using a plastic hammer, then remove the knuckle.



Front Suspension

Knuckle/Hub (cont'd)

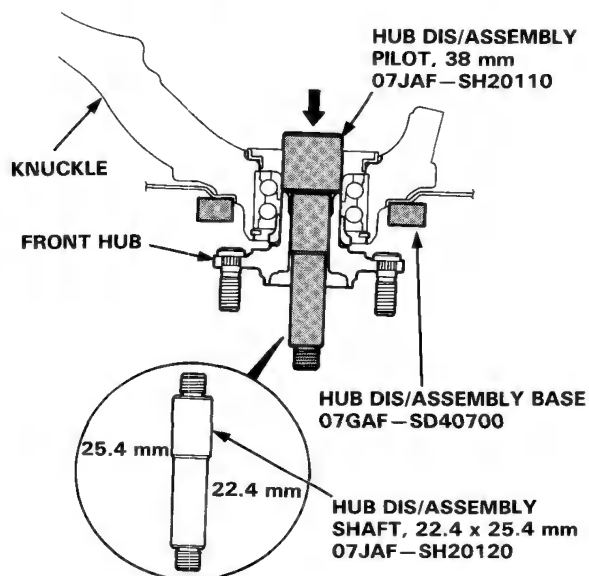
Hub Unit and Wheel Bearing Replacement

NOTE: Replace the bearing with a new one after removal.

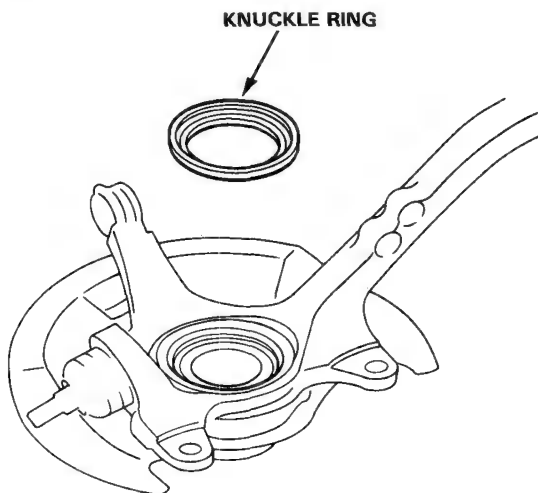
27. Separate the hub from the knuckle using the special tools and a hydraulic press.

CAUTION:

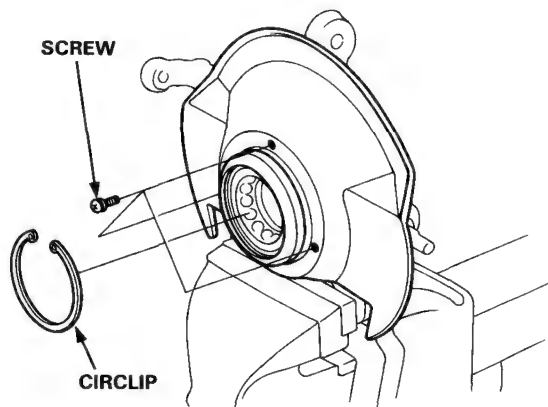
- Take care not to distort the splash guard.
- Hold onto the hub to keep it from falling when pressed clear.
- To prevent damage to the tool make sure the threads are fully engaged before pressing.



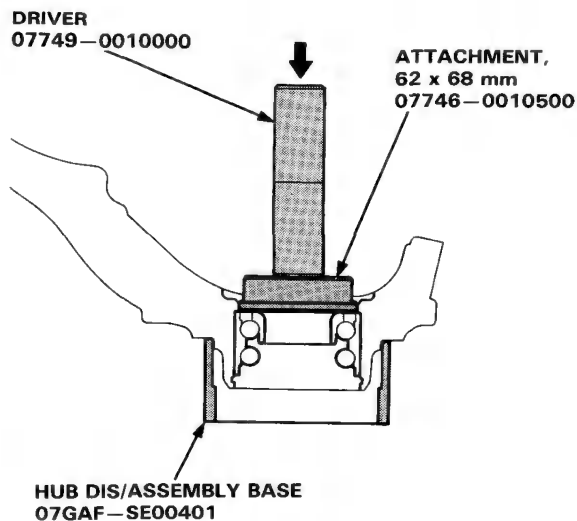
28. Remove the knuckle ring from the knuckle.



29. Remove the circlip and the splash guard from the knuckle.



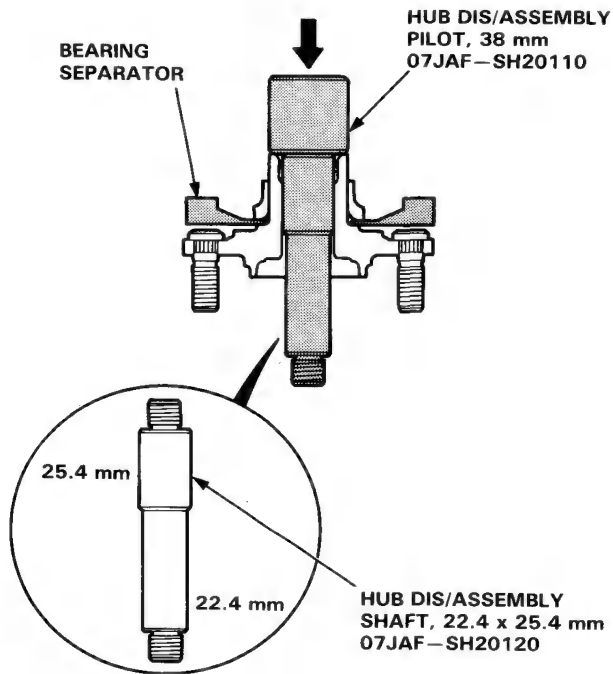
30. Press the wheel bearing out of the knuckle using a hydraulic press and the special tools shown below.





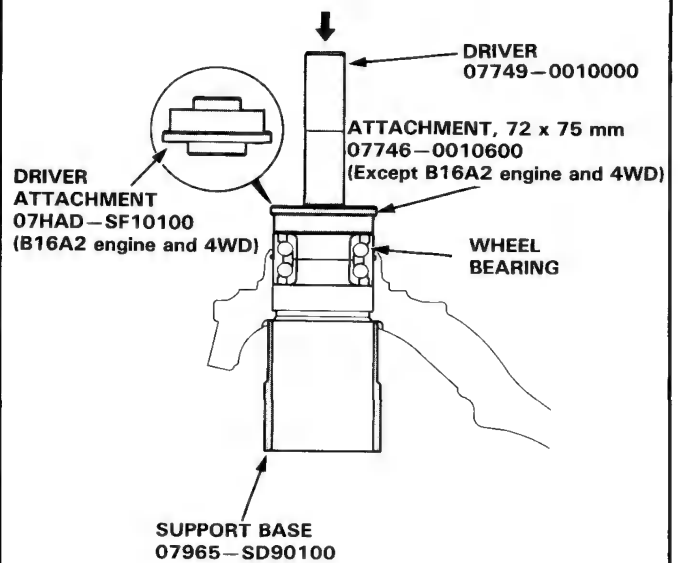
31. Remove the outboard bearing inner race from the hub using the special tools shown and a commercially available bearing separator.

CAUTION: To prevent damage to the tool make sure the threads are fully engaged before pressing.



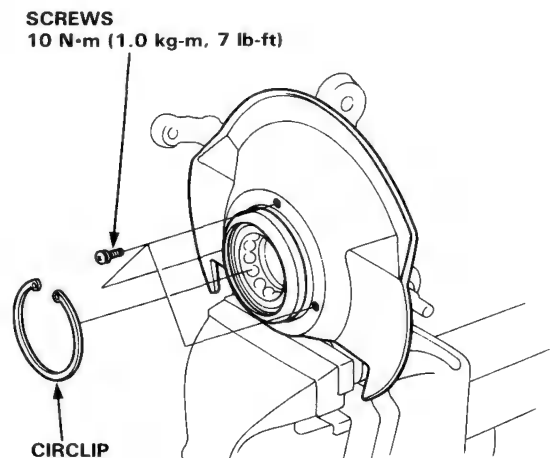
NOTE: Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

32. Press a new wheel bearing into the hub using the special tools shown and a hydraulic press.



33. Install the circlip securely in the knuckle groove.

34. Install the splash guard and tighten the screws.



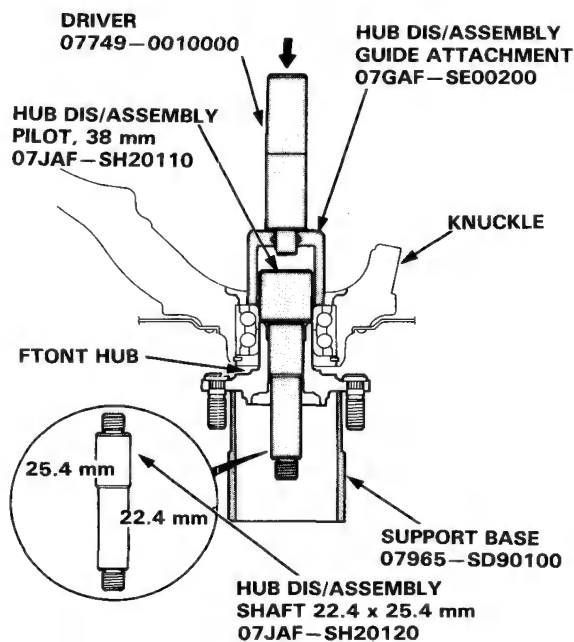
(cont'd)

Front Suspension

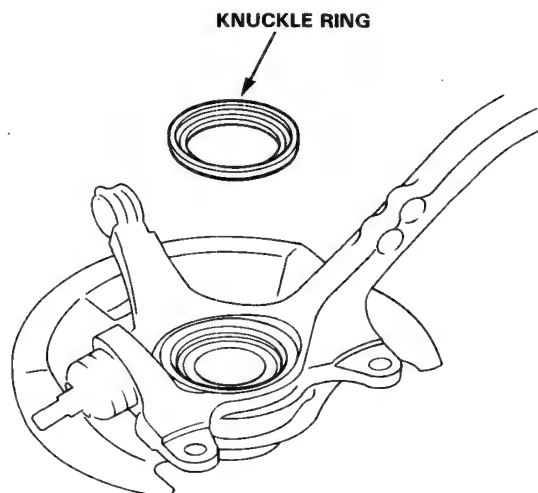
Knuckle/Hub (cont'd)

35. Install the hub on the knuckle using the special tools shown and a hydraulic press.

CAUTION: Take care not to distort the splash guard.



36. Install the knuckle ring on the knuckle.



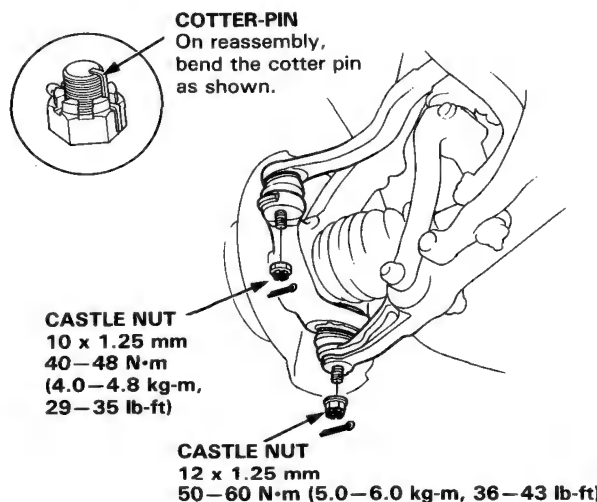
Installation

CAUTION:

- Be careful not to damage the ball joint boot.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole, Do not align the nut by loosening.

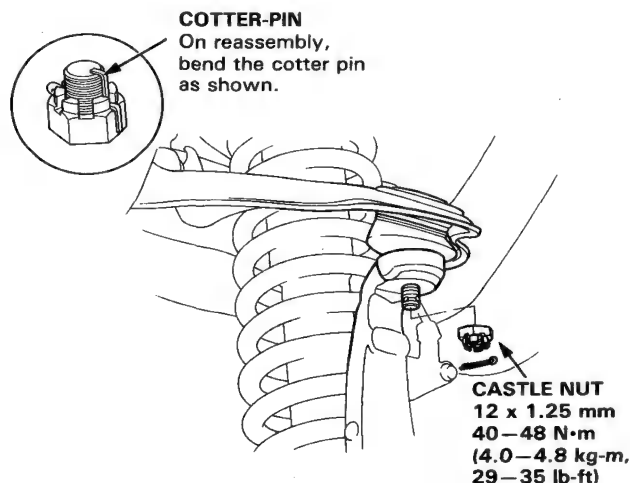
37. Install the knuckle on the driveshaft.

38. Install the knuckle on the lower arm and the tie-rod, then tighten the castle nuts and install new cotter pins.



39. Install the knuckle on the upper arm, then tighten the castle nut and install a new cotter pin.

40. Install the knuckle protector with the 6 mm bolt.

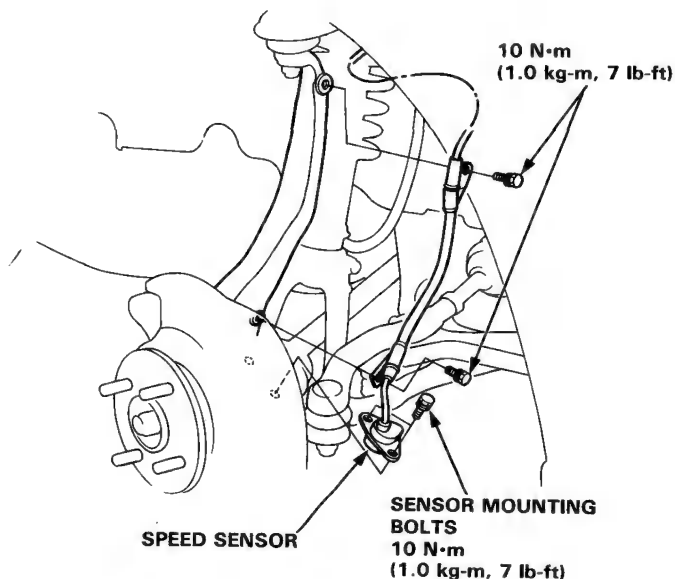




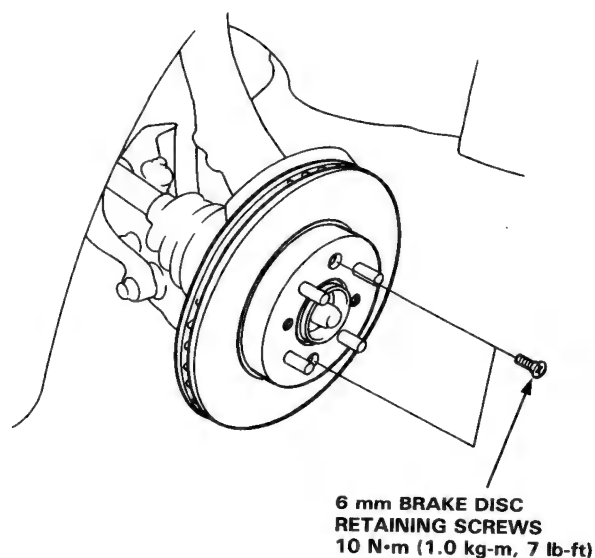
NOTE: Be careful when installing the sensors to avoid twisting wires.

41. Install the speed sensor with the sensor mounting bolts.

42. Install the sensor wire with the two bolts.

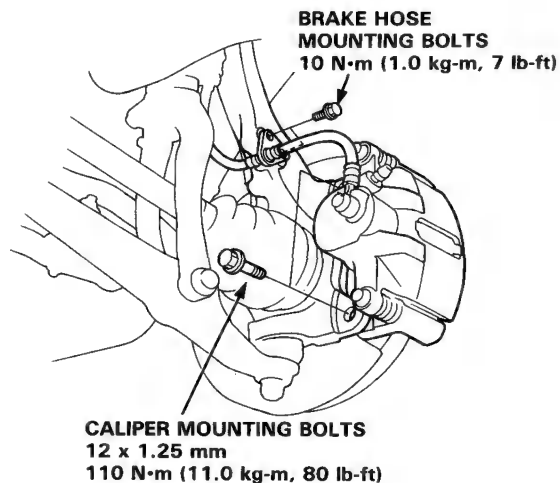


43. Install the brake disc with the 6 mm brake disc retaining screws.



44. Install the brake caliper with the caliper mounting bolts.

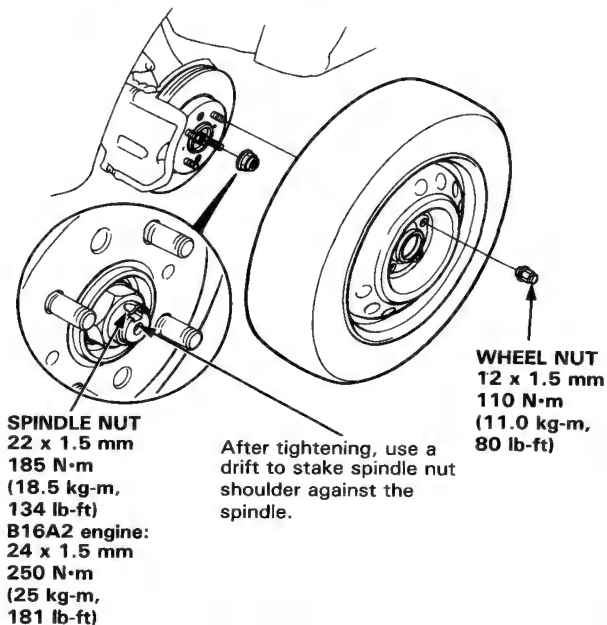
45. Install the brake hose with the brake hose mounting bolts.



46. Tighten the new spindle nut.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

47. Install the wheel with the wheel nuts.

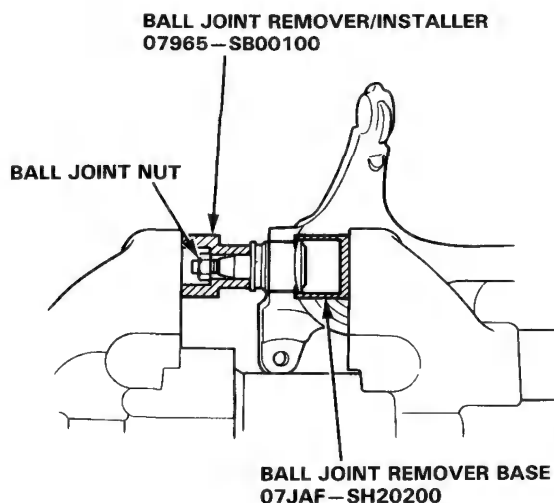


48. Check the front wheel alignment and adjust if necessary (see 18-5).

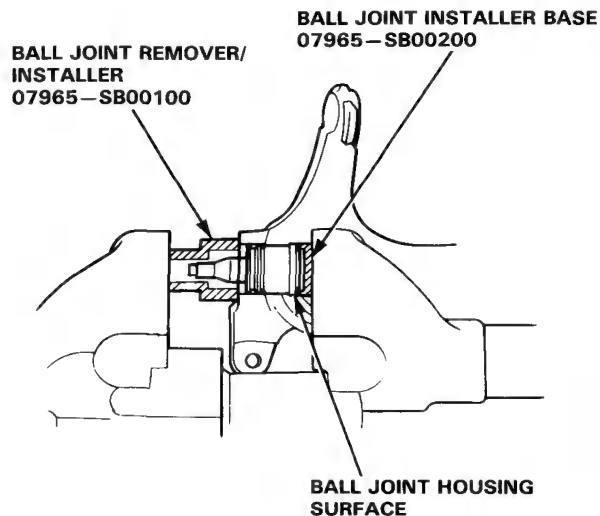
Front Suspension

Lower Ball Joint Replacement

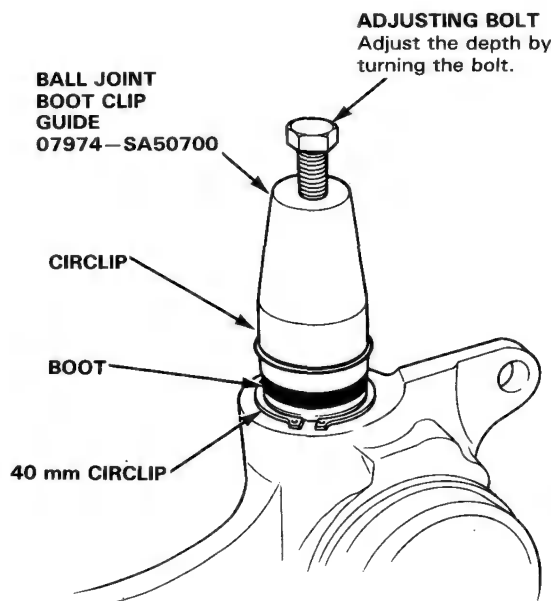
1. Remove the knuckle (page 18-11).
2. Remove the boot by prying the snap ring off.
3. Remove the 40 mm circlip.
4. Install the special tool on the ball joint and tighten the ball joint nut.
5. Position the special tool over the ball joint as shown then set the assembly in a vise. Press the ball joint out of the knuckle.



6. Place the ball joint in position by hand.
7. Install the special tools over the ball joint as shown, then press the ball joint in.



8. Install the 40 mm circlip.
9. Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the clip over the tool and into position.



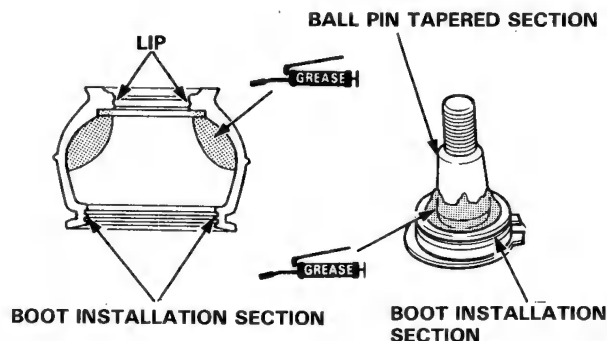


Ball Joint Boot Replacement

1. Remove the circlip and the boot.

CAUTION: Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.



3. Wipe the grease off the sliding surface of the ball pin and pack with fresh grease.

CAUTION:

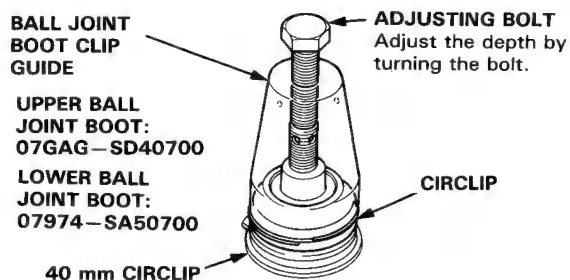
- Keep grease off the boot installation section and the tapered section of the ball pin.
- Do not allow dust, dirt, or other foreign materials to enter the boot.

4. Install the boot in the groove of the boot installation section securely, then bleed air.

5. Install the upper and lower ball joint boot clips using the special tools as follows:

LOWER BALL JOINT: Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the clip over the tool and into position.

UPPER BALL JOINT: Hold the tool over the ball joint, then slide the clip over the tool and into position.



CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

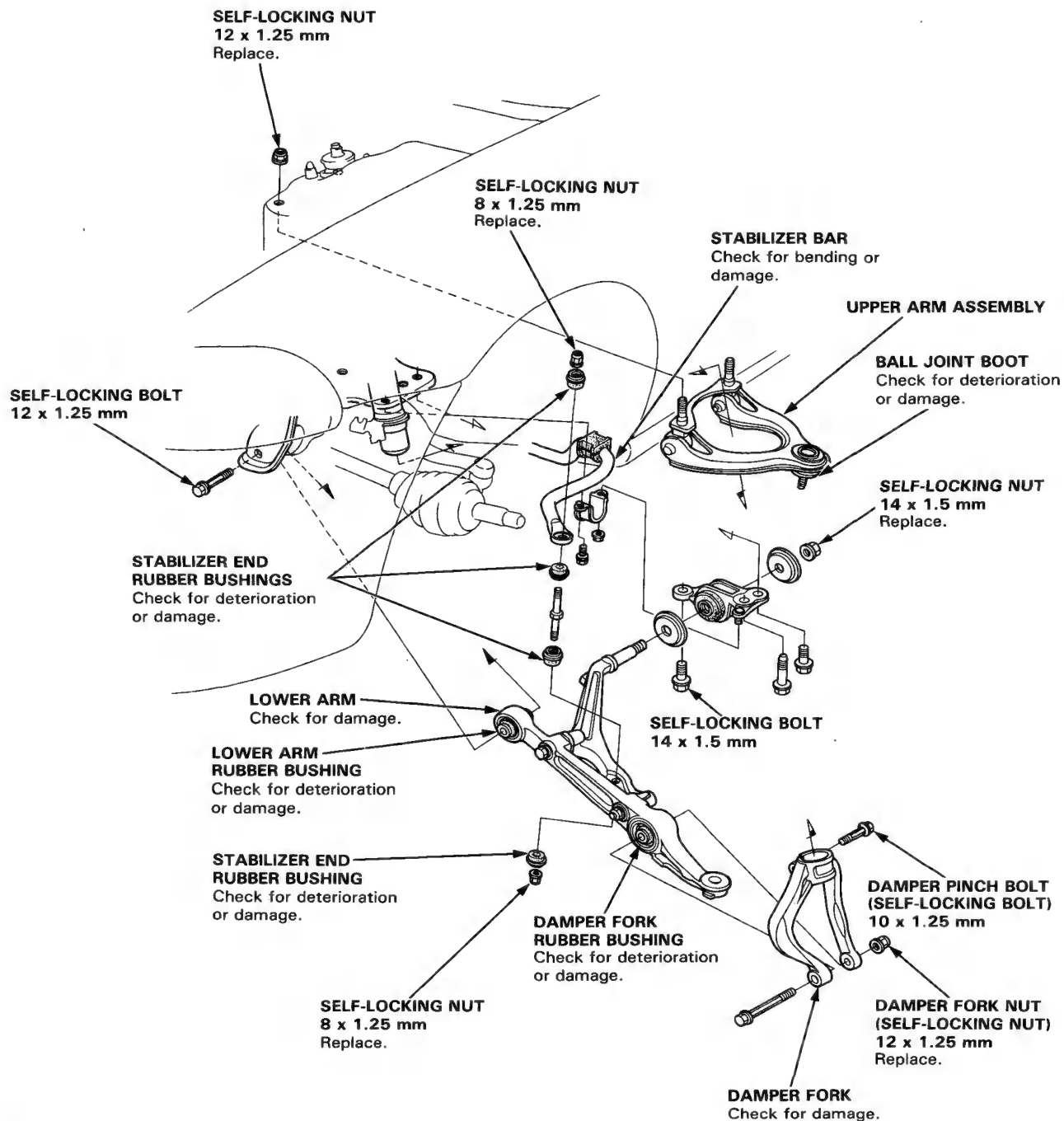
Front Suspension

Suspension Arms

Removal/Inspection

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).



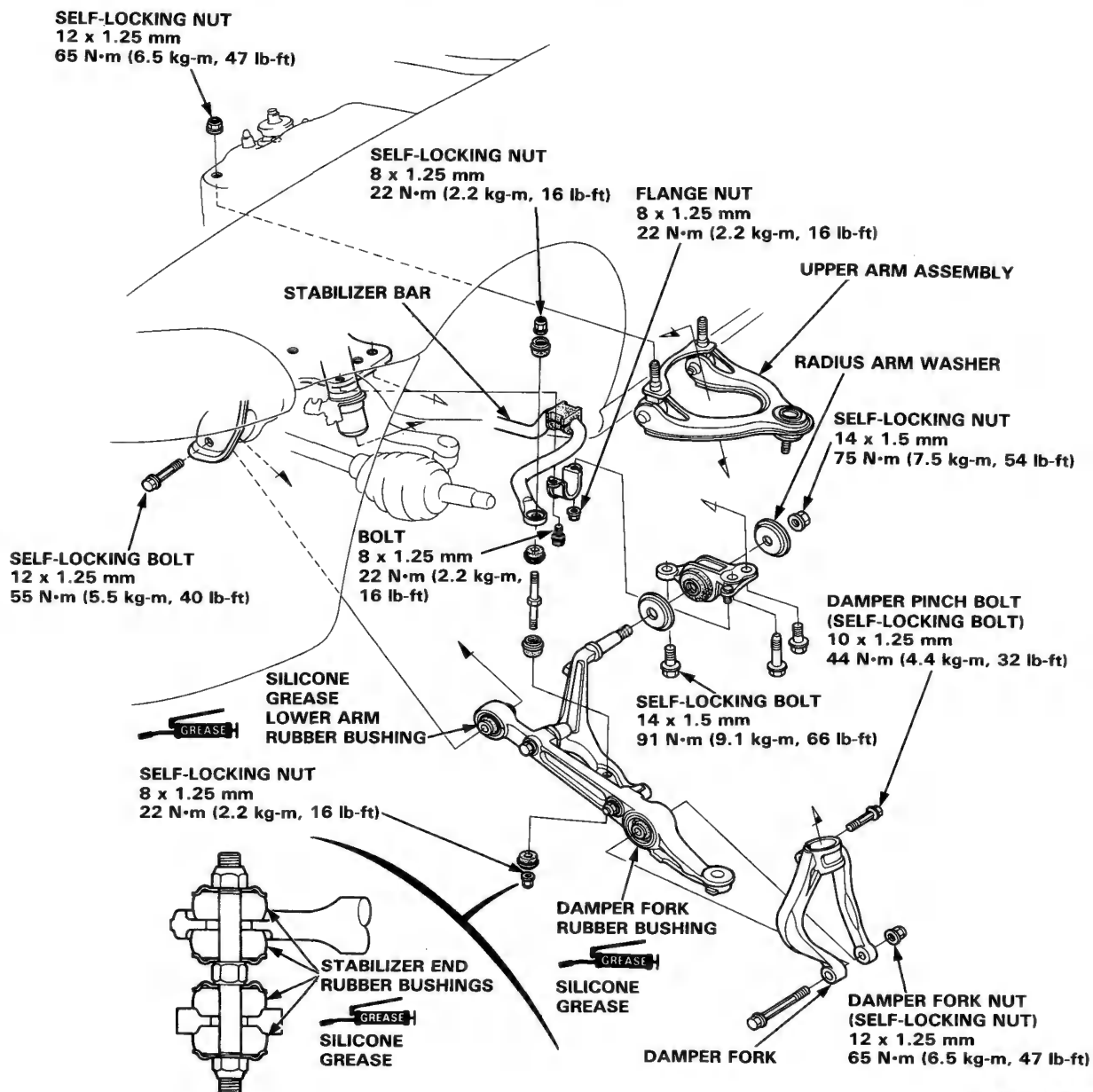


Installation

NOTE:

- Wipe off the grease before tightening the nut at the ball joint.
- The right and left damper forks are symmetrical. The left damper fork is marked with "VL" while the right damper fork is marked with "VR". Do not interchange them.
- The right and left upper arms are symmetrical. The left upper arm is marked with "SRZL" or "SRL" while the right arm is marked with "SRZR" or "SRR". Do not interchange them.
- After installing the suspension arm, check the wheel alignment and adjust if necessary.
- When installing the radius arm washers, the "FR" mark faces the front of the car.

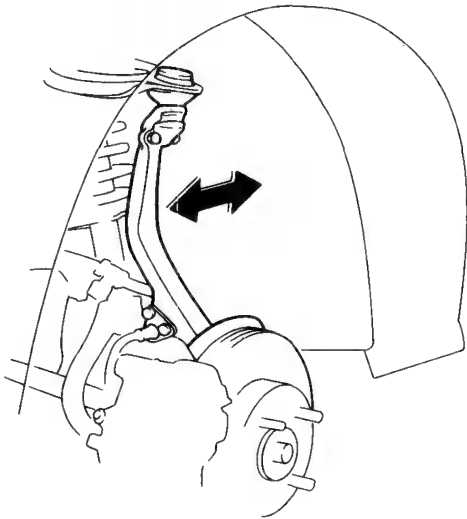
CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing are tightened.



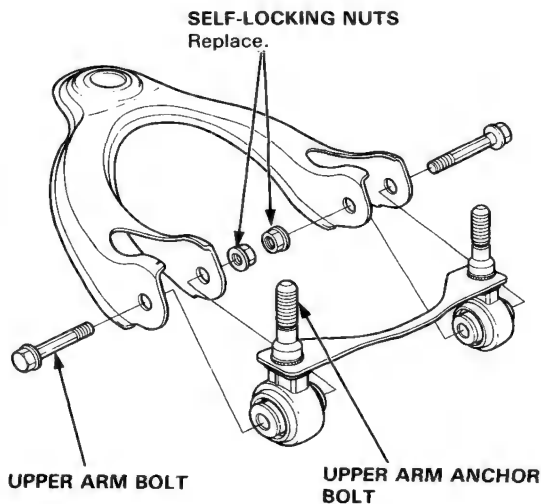
Front Suspension

Upper Arm Bushing Replacement

1. Remove the front wheels.
2. Rock the upper ball joint front-to-back.
3. Replace the upper arm bushings as follows if there is any play.

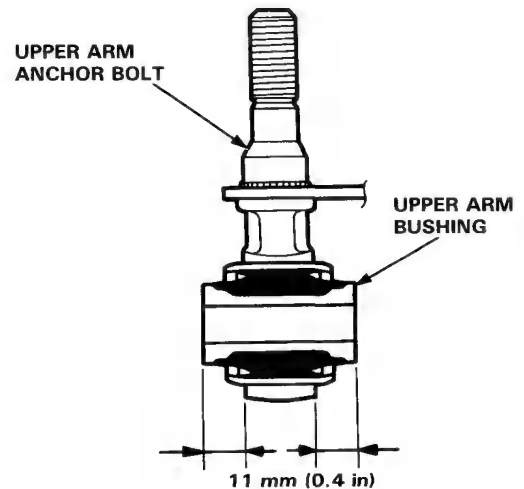


4. Remove the self-locking nuts, upper arm bolts and upper arm anchor bolts.



5. Place each upper arm anchor bolt in a vise and drive out the upper arm bushings.
6. Drive the new upper arm bushings into the upper arm anchor bolts.

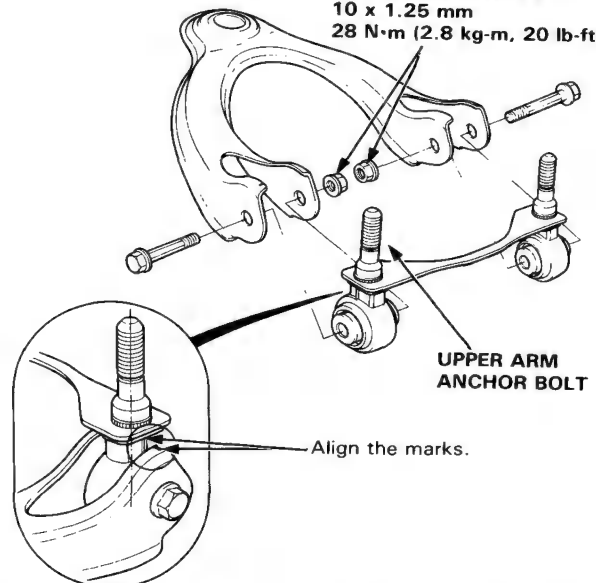
NOTE: Center the bushing so that 11 mm (0.4 in) protrudes from each side of the anchor bolt as shown.



7. Install the upper arm bolts and tighten the self-locking nuts.

NOTE: Align the upper arm anchor bolt with the mark on the upper arm.

SELF-LOCKING NUTS
10 x 1.25 mm
28 N·m (2.8 kg-m, 20 lb-ft)



8. After installation, check the camber (page 18-5).

Front Damper



Removal

1. Remove the brake hose clamp bolts from the damper.
2. Remove the damper pinch bolt.
3. Remove the damper fork bolt and remove the damper fork.

BRAKE HOSE CLAMP BOLTS

DAMPER FORK

DAMPER FORK BOLT

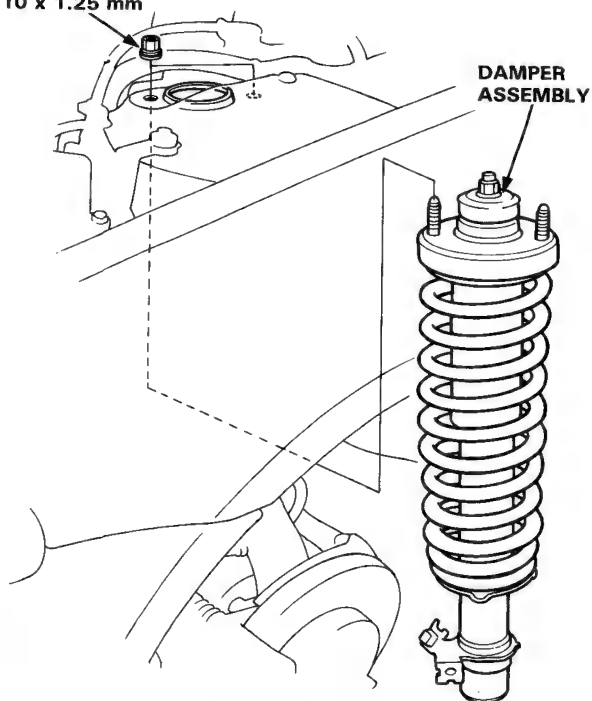
DAMPER PINCH BOLT (SELF-LOCKING BOLT)

DAMPER FORK NUT (SELF-LOCKING NUT)
Replace.

4. Remove the damper by removing the two nuts.

NUT
10 x 1.25 mm

DAMPER ASSEMBLY

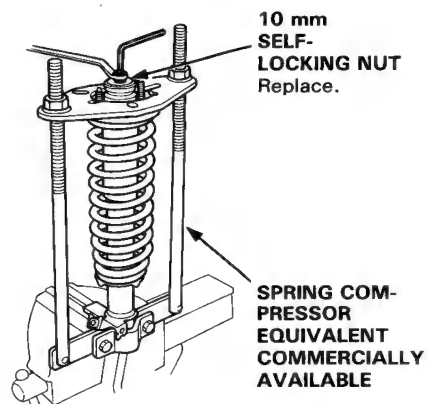


Disassembly/Inspection

Disassembly:

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

CAUTION: Do not compress the spring more than necessary to remove the nut.

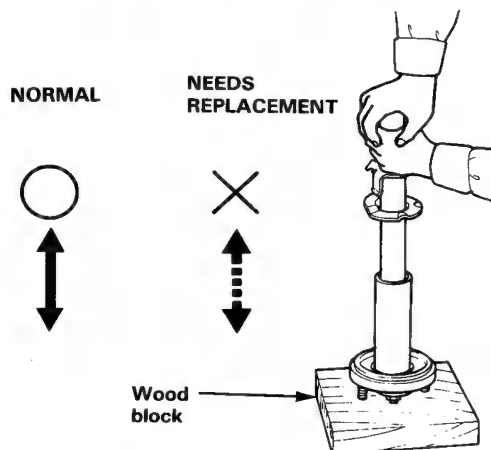


2. Remove the spring compressor then disassemble the damper as shown on the next page.

Inspection:

1. Reassemble all parts, except the spring.
2. Push on the damper assembly as shown.
3. Check for smooth operation through a full stroke, both compression and extension.

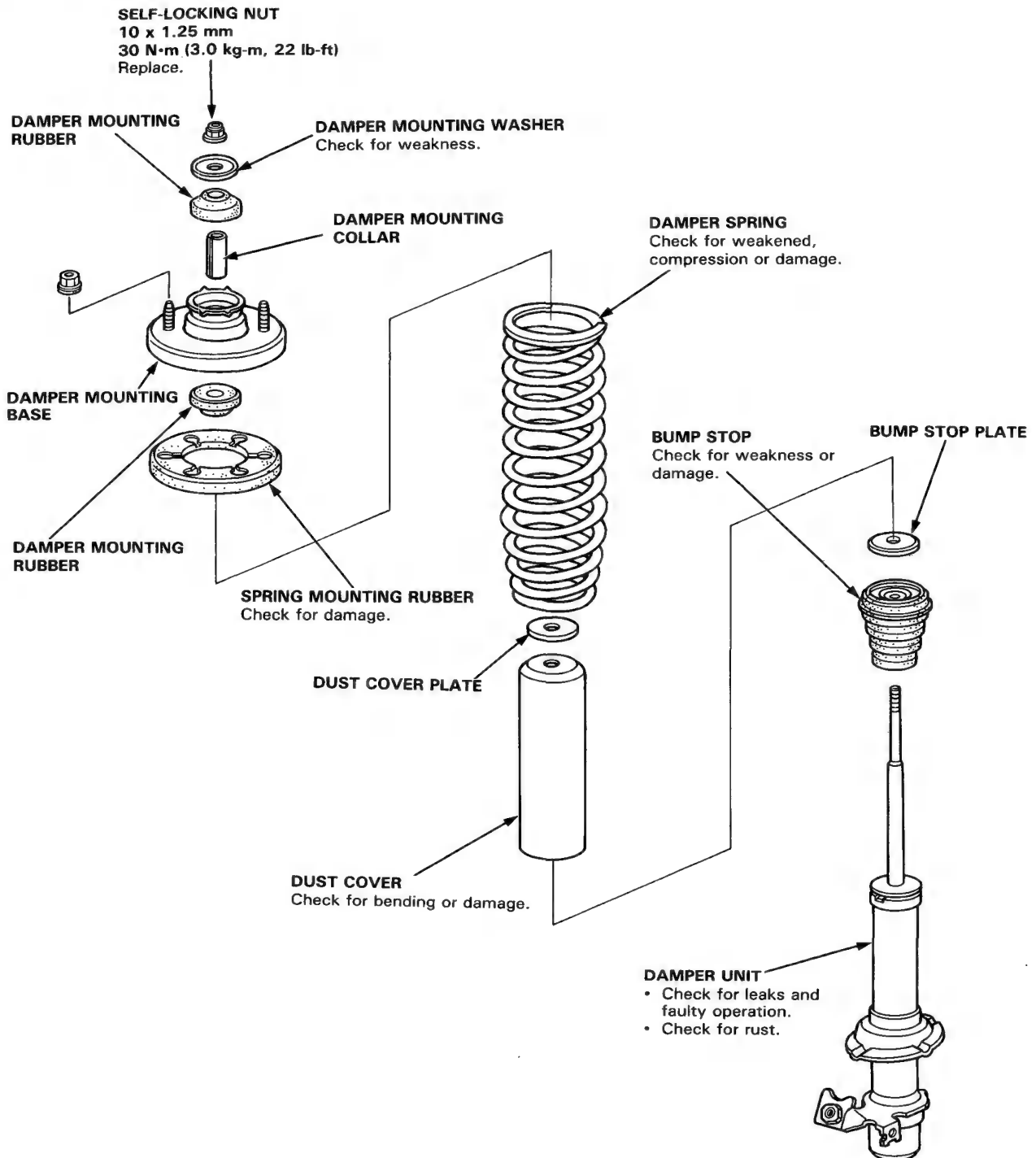
NOTE: The damper should move smoothly. If it does not (no compression or no extension), then gas is leaking, and the damper should be replaced.



4. Check for oil leaks, abnormal noises or binding during these tests.

Front Damper

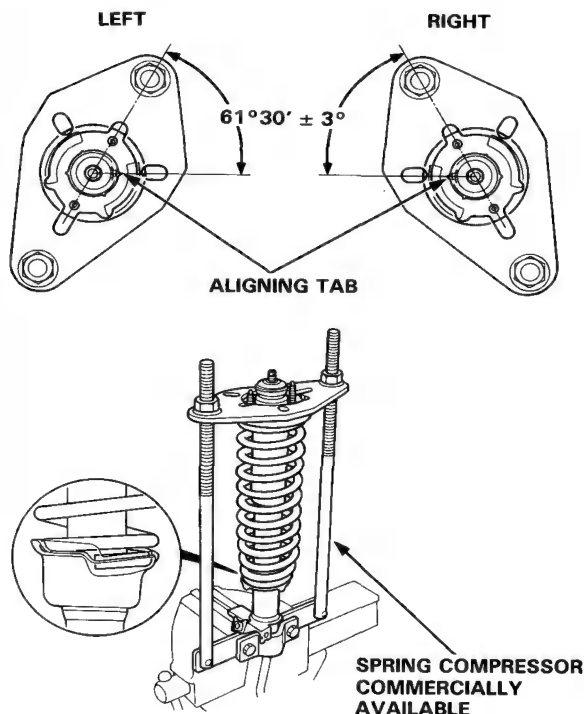
Inspection





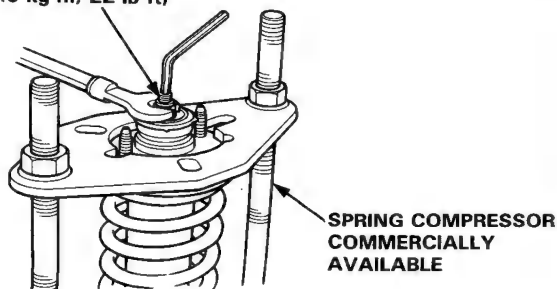
Reassembly

1. Install the damper unit, damper spring, bump stop, bump stop plate, dust cover, spring mounting rubber, damper mounting collar on the spring compressor.
2. Install the damper mounting base on the damper unit as shown.



3. Compress the damper spring.
4. Install the damper mounting rubber, damper mounting washer and a new 10 mm self-locking nut.
5. Hold the damper shaft and tighten the 10 mm self-locking nut.

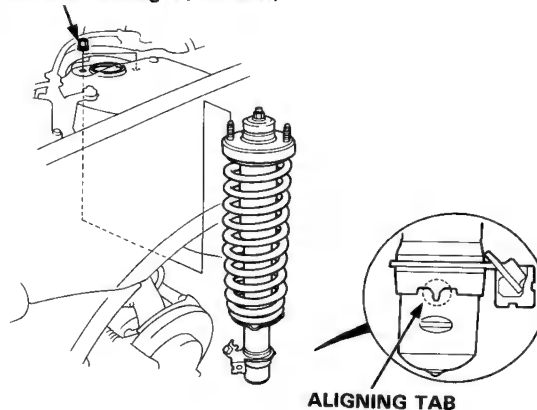
SELF-LOCKING NUT
10 x 1.25 mm
30 N·m
(3.0 kg-m, 22 lb-ft)



Installation

1. Loosely install the damper on the frame with the aligning tab facing inside.

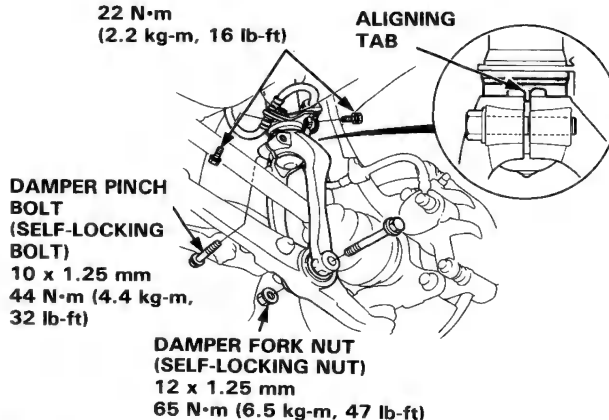
NUT
10 x 1.25 mm
50 N·m (5.0 kg-m, 36 lb-ft)



2. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.
3. Hand-tighten the bolts and nuts.
4. Raise the knuckle with a floor jack until the car just lifts off the safety stand.

NOTE: The bolts and nuts should be tightened with the vehicle's weight on the damper.

22 N·m
(2.2 kg-m, 16 lb-ft)



DAMPER PINCH BOLT (SELF-LOCKING BOLT)
10 x 1.25 mm
44 N·m (4.4 kg-m, 32 lb-ft)

DAMPER FORK NUT (SELF-LOCKING NUT)
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

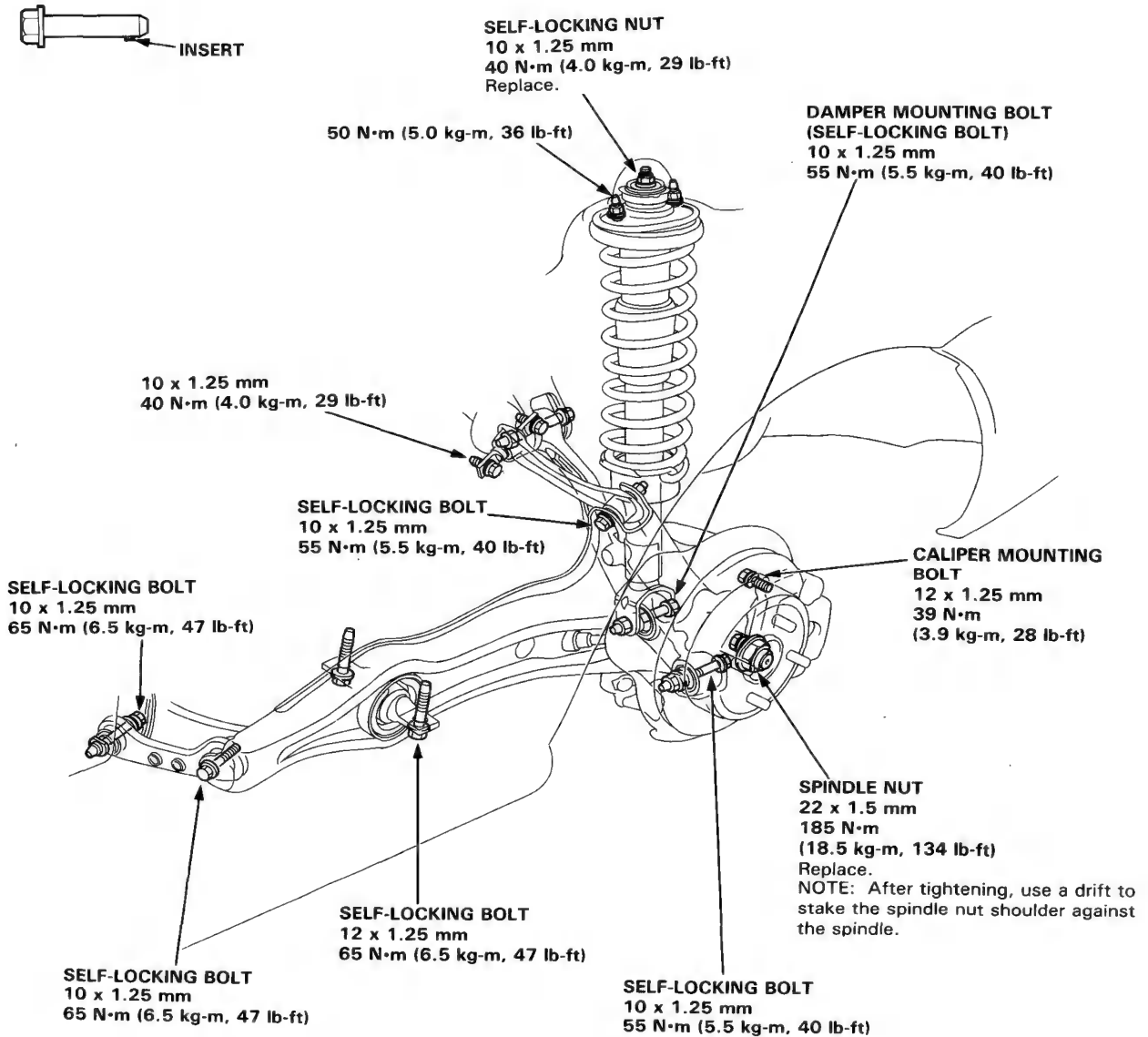
5. Tighten the damper pinch bolt.
6. Secure the damper fork bolt with a new self-locking nut.
7. Secure the damper assembly to the frame with the flange nuts.
8. Install the brake hose clamps with the two bolts.

Rear Suspension

Torque Specifications

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



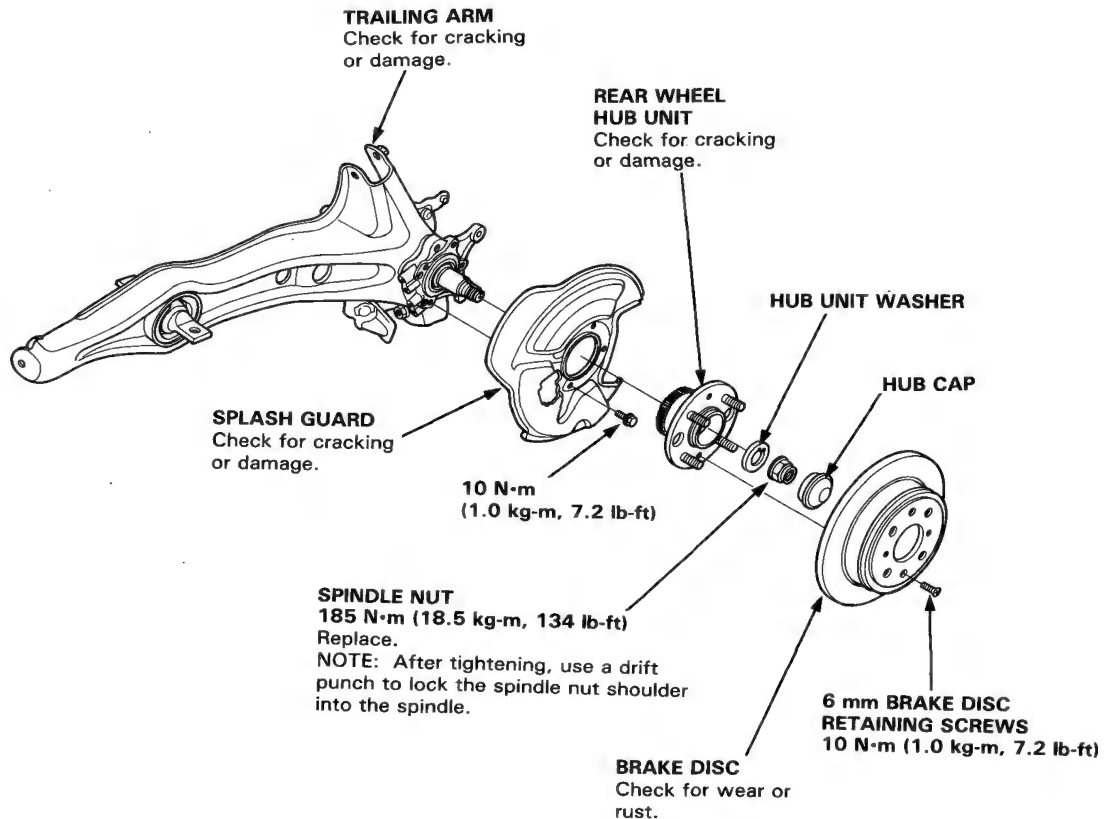


Hub Bearing Unit (2WD)

Illustrated Index

NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- Remove the center cap by prying it out with a flat screwdriver. Use a rag at the point you are going to pry because aluminum alloy wheels can be easily damaged. Avoid damage to the cap by not allowing it to fall during removal.
- Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

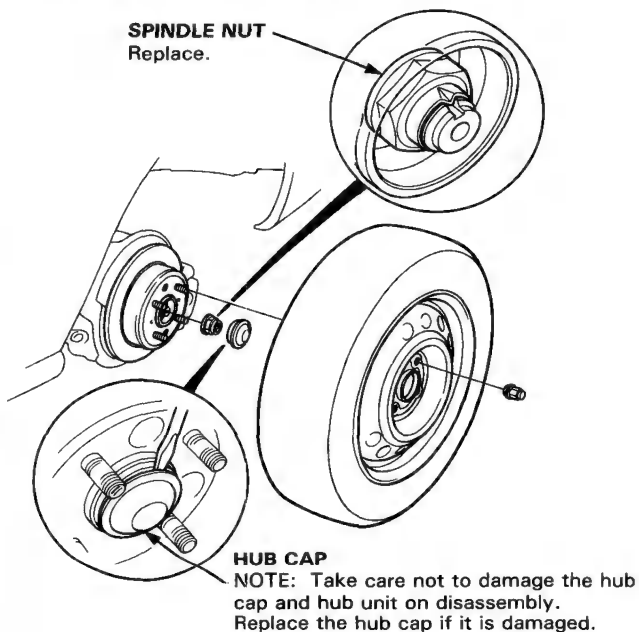


Rear Suspension

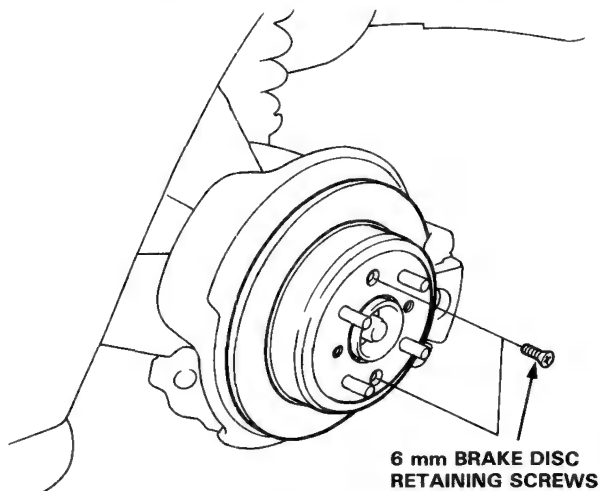
Hub Bearing Unit (2WD)

Removal

1. Raise the rear of car and support it with safety stands in proper locations.
2. Remove the rear wheel.
3. Pull the parking brake lever up.
4. Remove the hub cap, then raise the locking tab on the spindle nut, then remove the nut.

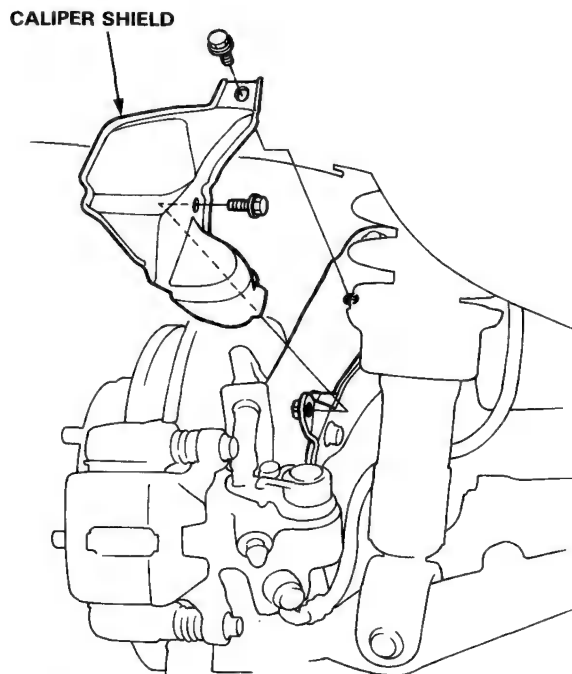


5. Remove the 6 mm brake disc retaining screws.



6. Release the parking brake lever.

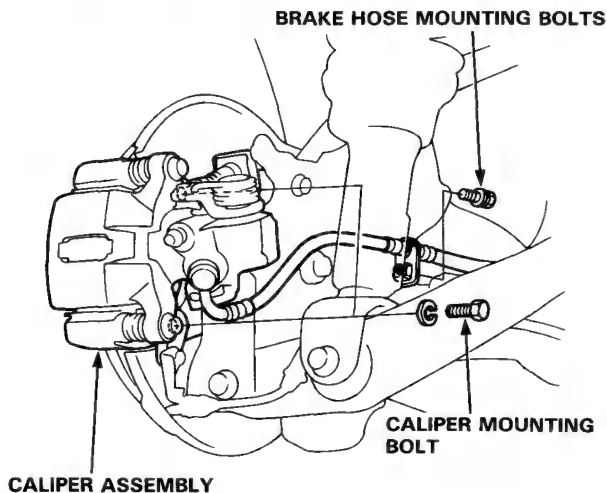
7. Remove the caliper shield.



8. Remove the brake hose mounting bolts.

9. Remove the caliper bracket mounting bolts and hang the caliper assembly to one side.

CAUTION: To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper assembly from the undercarriage.

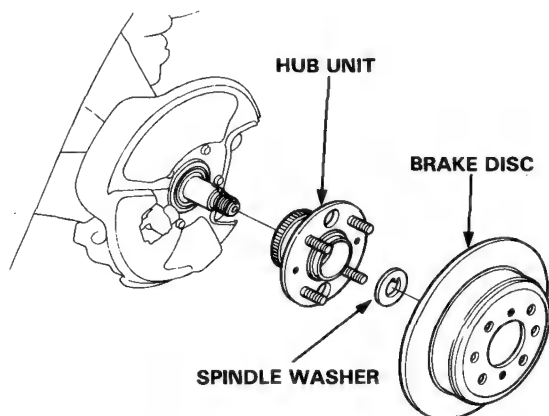




10. Screw two 8 x 12 mm bolts into the disc to push it away from the hub.

NOTE: Turn each bolt two turns at a time to prevent cocking the disc excessively.

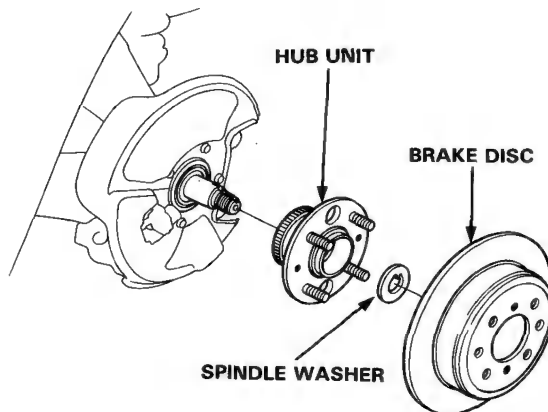
11. Remove the brake disc.
12. Remove the hub unit from the knuckle.



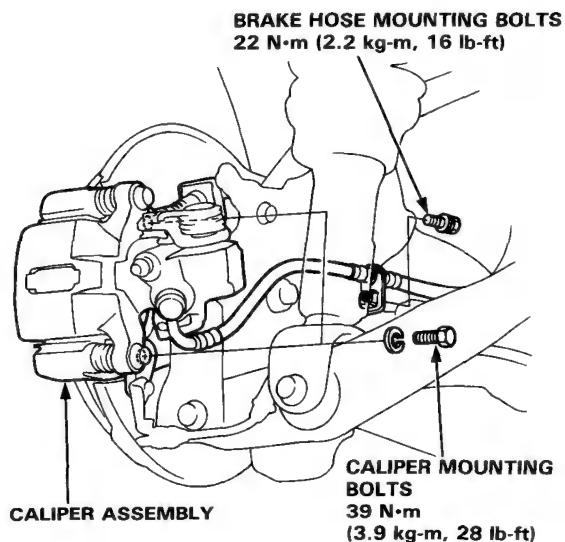
Installation

NOTE: Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.

13. Install the hub unit, spindle washer and brake disc.



14. Install the brake caliper with the caliper mounting bolts.
15. Install the brake hose with the brake hose mounting bolts.

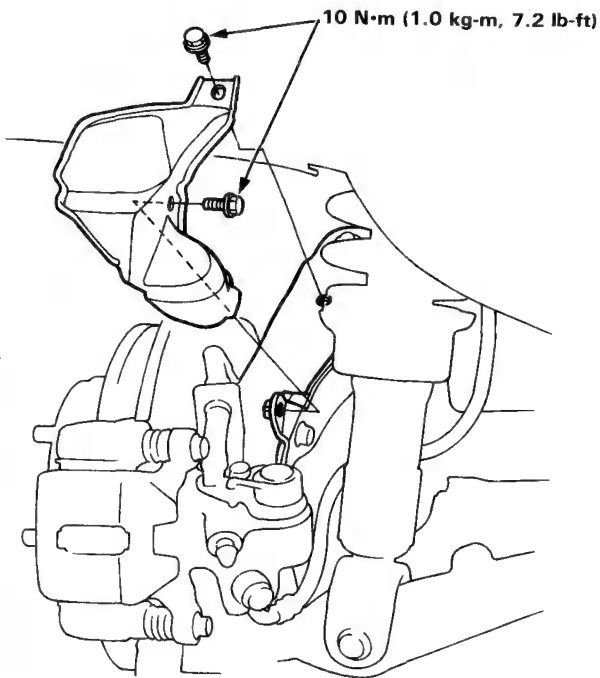


(cont'd)

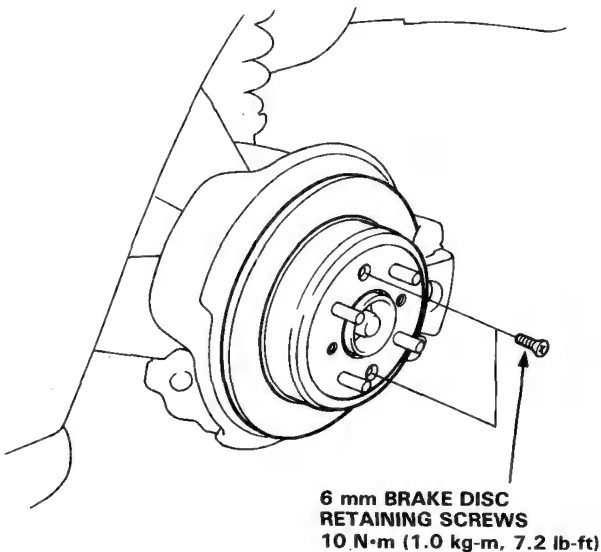
Rear Suspension

Hub Bearing Unit (2WD cont'd)

16. Install the caliper shield.



17. Tighten the 6 mm brake disc retaining screws.

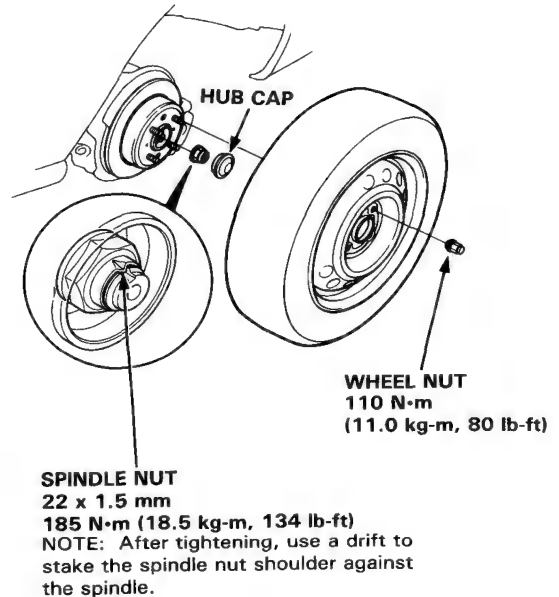


18. Tighten the new spindle nut.

19. Install the hub cap.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

20. Install the wheel with the wheel nuts.



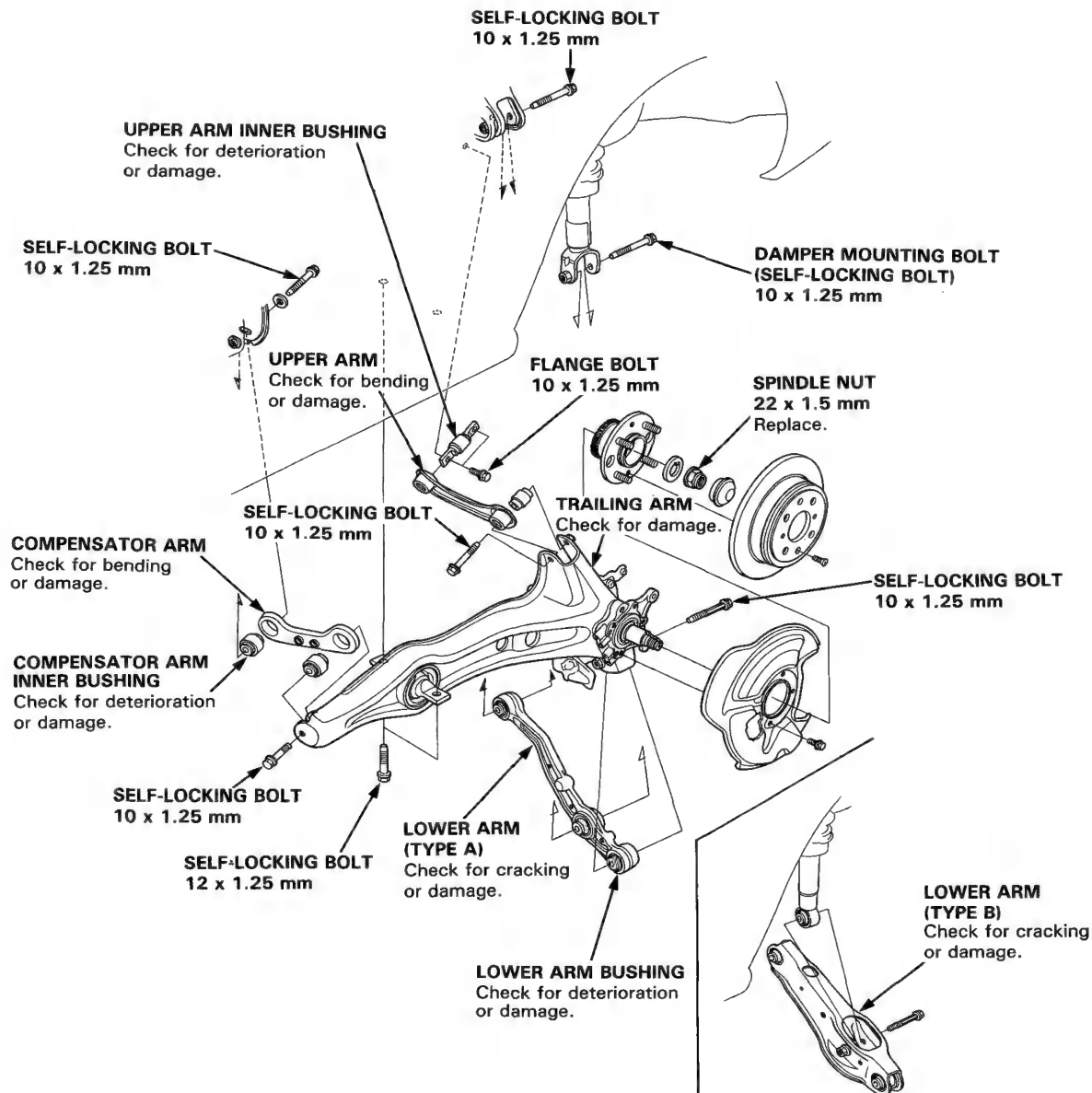


Suspension Arms (2WD)

Removal/Inspection

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).



Rear Suspension

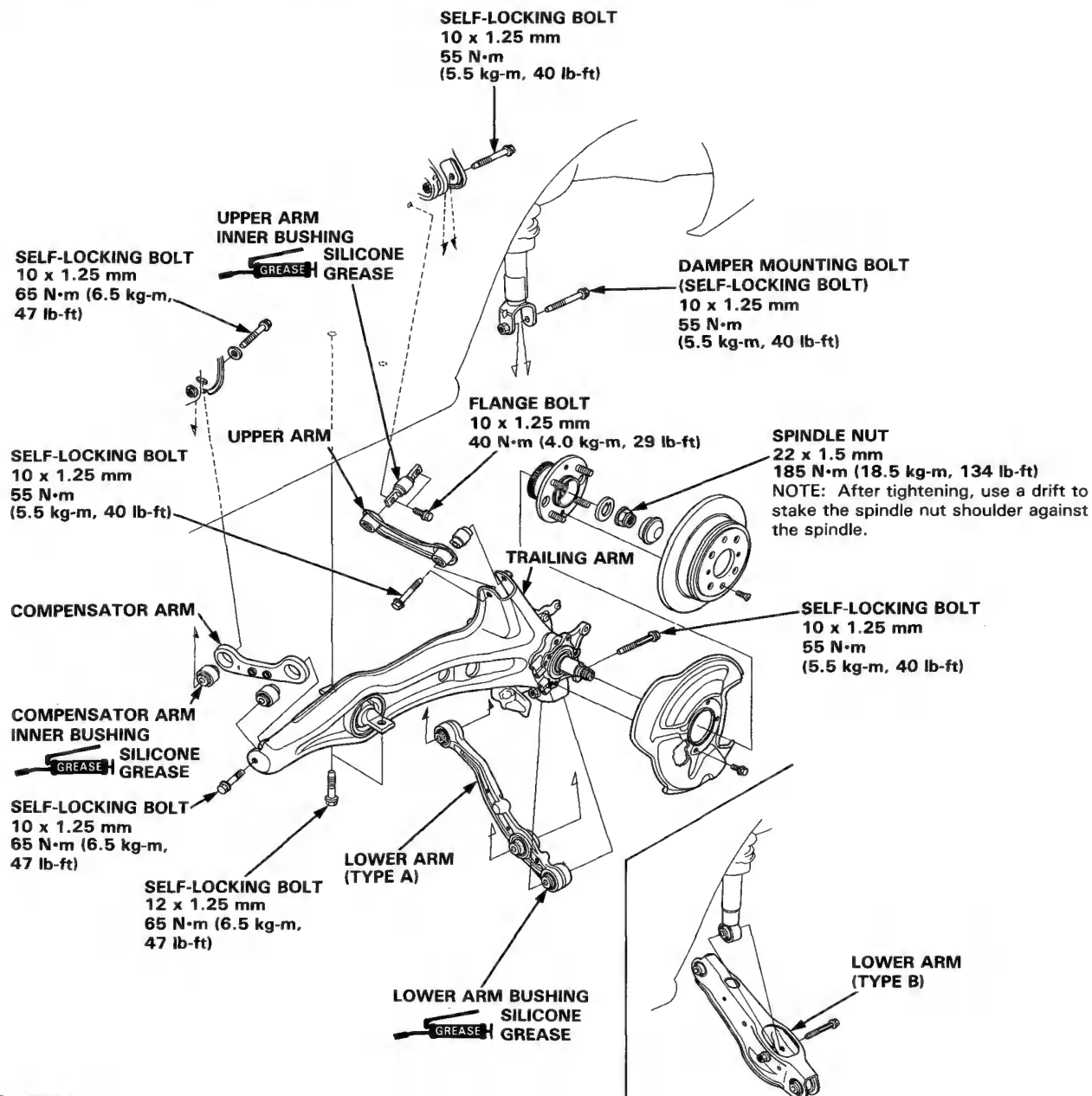
Suspension Arms (2WD)

Installation

NOTE:

- Make sure the toe adjusting bolts on the compensator arm are installed in the same direction.
- "L", "LH", "LHG", "LS" or "LV" is stamped on the left lower arm and "R", "RH", "RHG", "RS" or "RV" on the right lower arm.
- "↑ UP LK" or "↑ UP LK Z" is stamped on the left upper arm and "↑ UP RK" or "↑ UP RK Z" on the right upper arm.
- The right and left compensator arm are symmetrical. Install so the "UP ↑" mark points to the front.
- After installing the suspension arm, check the wheel alignment and adjust if necessary.

CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing are tightened.



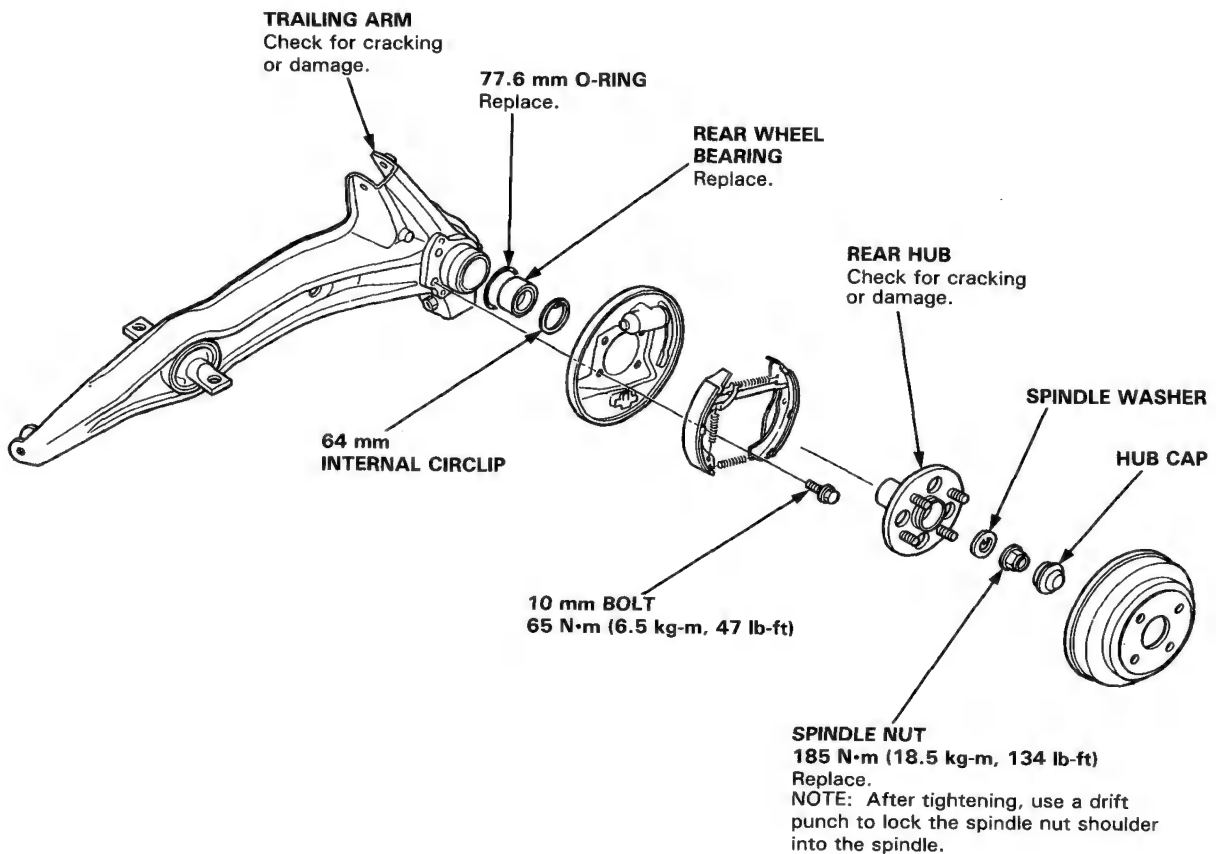


Hub Unit Bearing (4WD)

Illustrated Index

NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- Remove the center cap by prying it out with a flat screwdriver. Use a rag at the point you are going to pry because aluminum alloy wheels can be easily damaged. Avoid damage to the cap by not allowing it to fall during removal.
- Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.



Rear Suspension

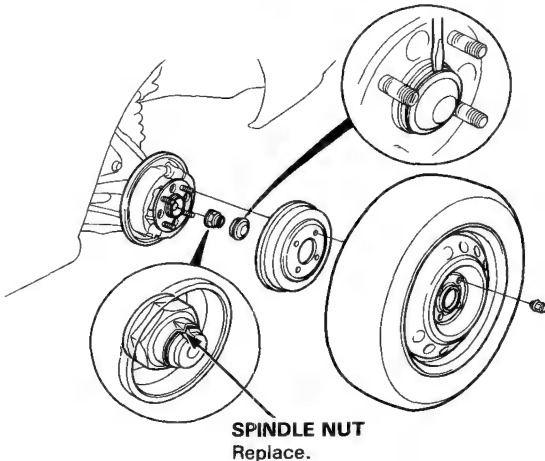
Hub Unit Bearing (4WD)

Removal

1. Raise the rear of car and support it with safety stands in proper locations.
2. Remove the rear wheel.
3. Remove the brake drum.
4. Remove the hub cap, then raise the locking tab on the spindle nut, then remove the nut.

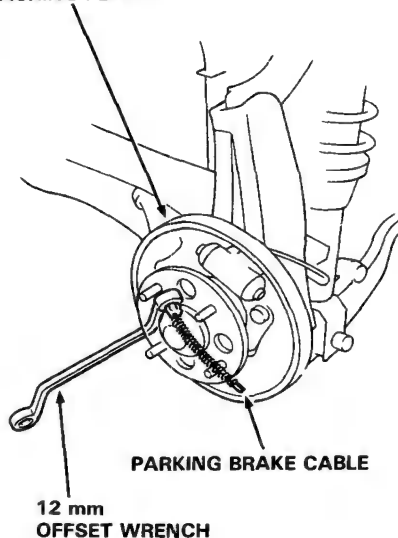
HUB CAP

NOTE: Take care not to damage the hub cap and hub unit on disassembly.
Replace the hub cap if it is damaged.



5. Remove the parking brake cable from the backing plate using 12 mm offset wrench as shown.

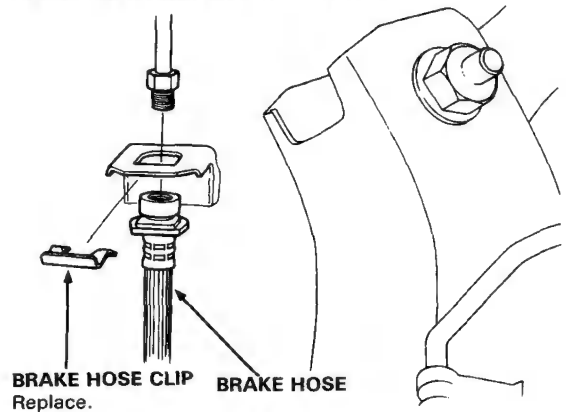
BACKING PLATE



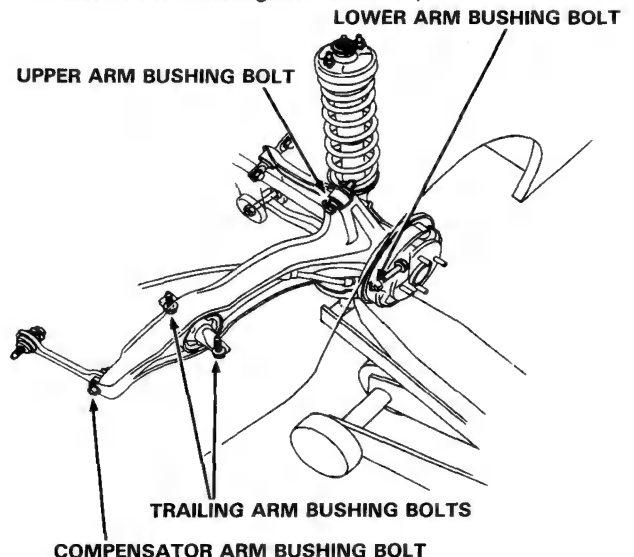
6. Disconnect the brake hose from the brake pipe using a 10 mm flare nut wrench.

CAUTION:

- Replace parts with new ones whenever specified to do so.
- Avoid spilling brake fluid on painted surfaces as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.



7. Use a floor jack to support the lower arm.
8. Remove the trailing arm bushing mounting bolts.
9. Remove the upper arm and compensator arm from the trailing arm.
10. Pull the trailing arm and remove the rear driveshaft outboard joint from the trailing arm using a two-jaw puller.
11. Remove the trailing arm assembly.





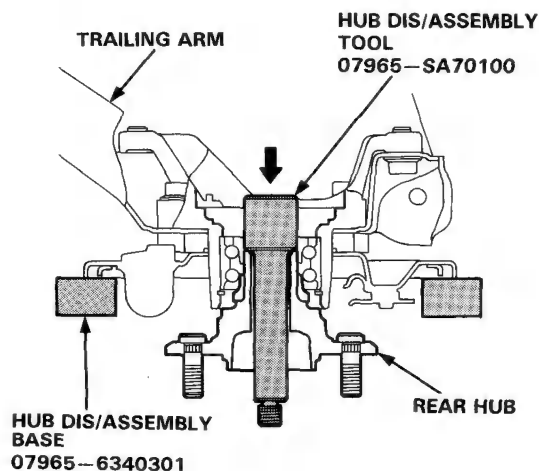
Replacement

NOTE: Replace the bearing with a new one after removal.

12. Separate the hub from the trailing arm using the special tools and a hydraulic press.

CAUTION:

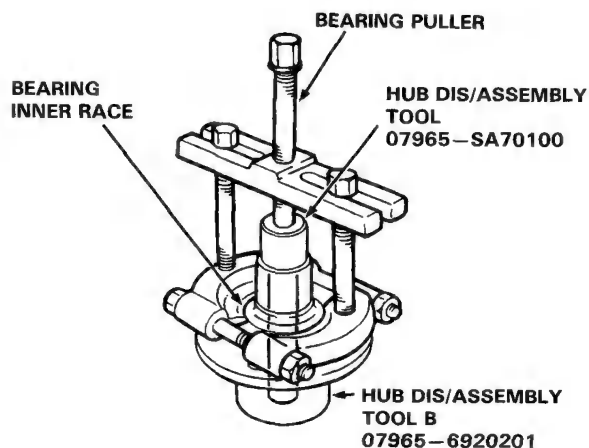
- Take care not to distort the backing plate.
- Hold onto the rear hub and trailing arm to keep it from falling when pressed clear.



13. Remove the outboard bearing inner race from the hub using the special tools shown and a bearing puller.

CAUTION:

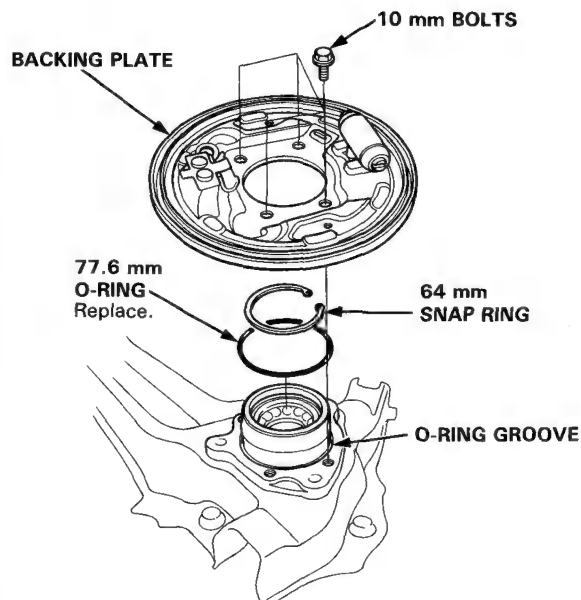
To prevent damage to the tool make sure the threads are fully engaged before pressing.



14. Remove the 64 mm snap ring.

15. Remove the 10 mm bolts and backing plate.

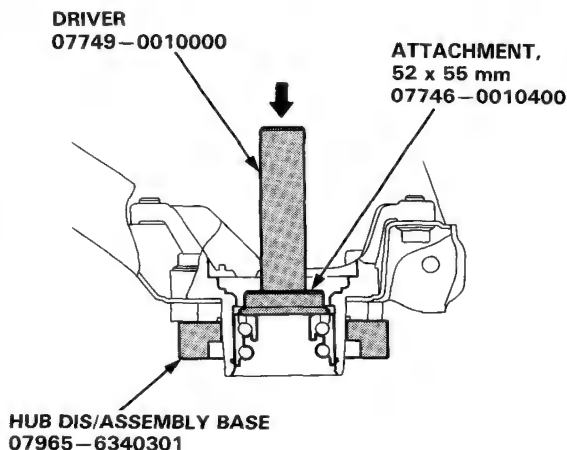
16. Remove the 77.6 mm O-ring from the groove of bearing holder plate.



17. Press the wheel bearing out of the trailing arm using the special tools shown and a hydraulic press.

CAUTION:

Hold onto the trailing arm to keep it from falling when bearing is pressed clear of trailing arm.



(cont'd)

Rear Suspension

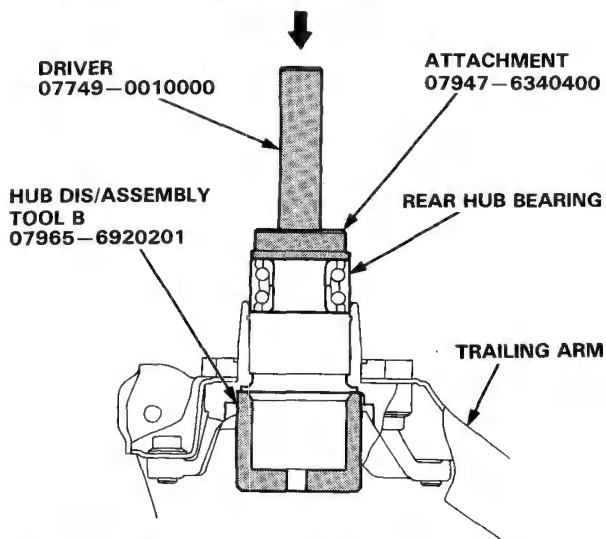
Hub Unit Bearing Replacement (4WD, cont'd)

CAUTION: Before reassembling, check that all parts are free of dust and other foreign particles.

18. Press a new wheel bearing into the trailing arm using the special tools shown and a hydraulic press.

CAUTION:

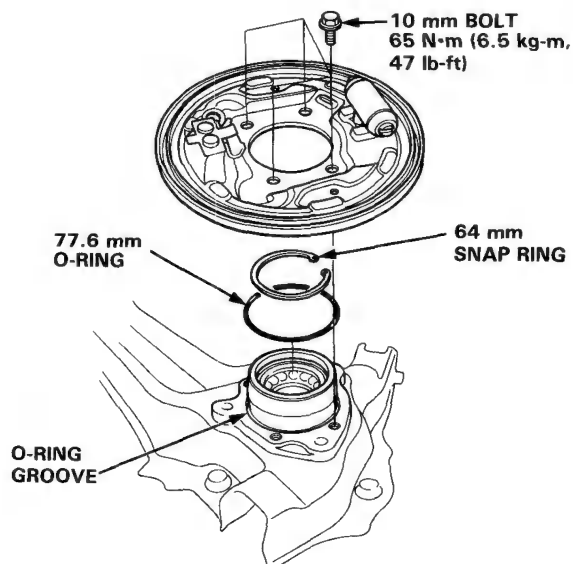
Maximum press load: 2 tons.



19. Install the 77.6 mm O-ring on the groove of the bearing holder plate.

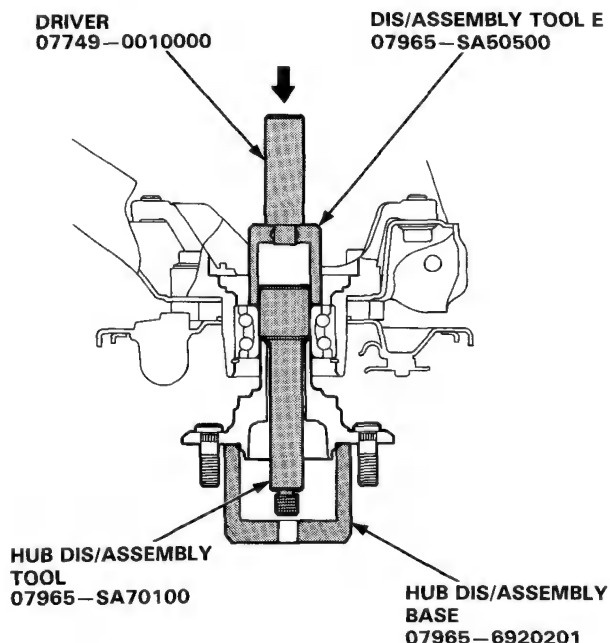
20. Install the backing plate and tighten the 10 mm bolts.

21. Install the 64 mm snap ring securely in the trailing arm groove.



22. Place the hub onto the special tool.

23. Set the trailing arm in position and install using the special tools and hydraulic press.





Installation

24. Connect the trailing arm to the rear driveshaft.
25. Connect the trailing arm to the lower arm, upper arm and compensator arm, then loosely install the trailing arm bushing bolts and nut.
26. Raise the rear suspension with a floor jack until the weight of the car is on the rear suspension, then tighten the trailing arm bushing bolts and nut.

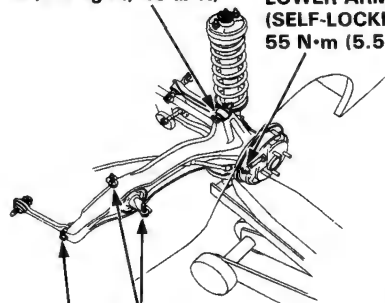
NOTE: The trailing arm bushing bolts and nut should be tightened with the rear suspension under vehicle load.

UPPER ARM BUSHING BOLT

55 N·m (5.5 kg-m, 40 lb-ft)

LOWER ARM BUSHING NUT (SELF-LOCKING NUT)

55 N·m (5.5 kg-m, 40 lb-ft)



TRAILING ARM BUSHING BOLTS

65 N·m (6.5 kg-m, 47 lb-ft)

COMPENSATOR ARM BUSHING BOLT

65 N·m (6.5 kg-m, 47 lb-ft)

27. Connect the brake hose to the brake pipe using a 10 mm flare nut wrench, then install the new brake hose clip.

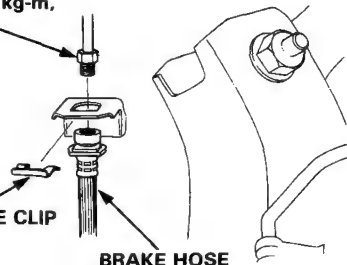
CAUTION:

- Use only clean brake fluid.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Avoid spilling brake fluid on painted surfaces as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.

15 N·m (1.5 kg-m,
11 lb-ft)

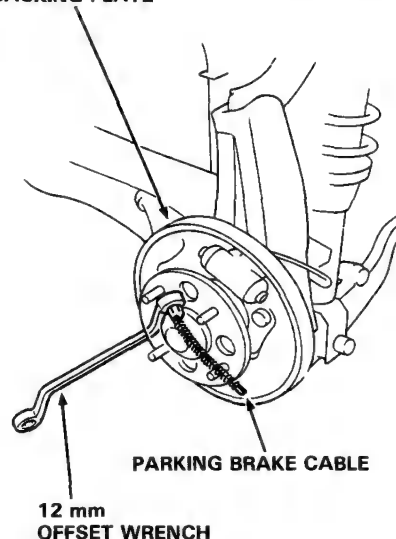
BRAKE HOSE CLIP

BRAKE HOSE



28. Connect the parking brake cable to the backing plate using 12 mm offset wrench as shown.

BACKING PLATE



PARKING BRAKE CABLE

12 mm
OFFSET WRENCH

29. Install the new spindle nut, then tighten the nut.
30. Install the brake drum.
31. Install the rear wheel with the wheel nut.

NOTE: Before installing the wheel, clean the mating surface of the brake drum and inside of the wheel.

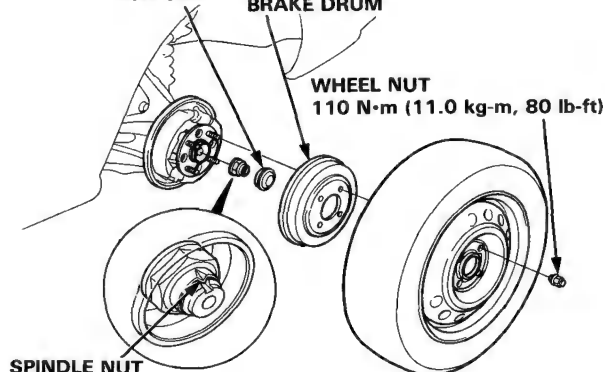
32. Check the rear wheel alignment and adjust if necessary (page 18-5).

HUB CAP

BRAKE DRUM

WHEEL NUT

110 N·m (11.0 kg-m, 80 lb-ft)



SPINDLE NUT

22 x 1.5 mm

185 N·m (18.5 kg-m, 134 lb-ft)

NOTE: After tightening, use a drift to stake the spindle nut shoulder against the spindle.

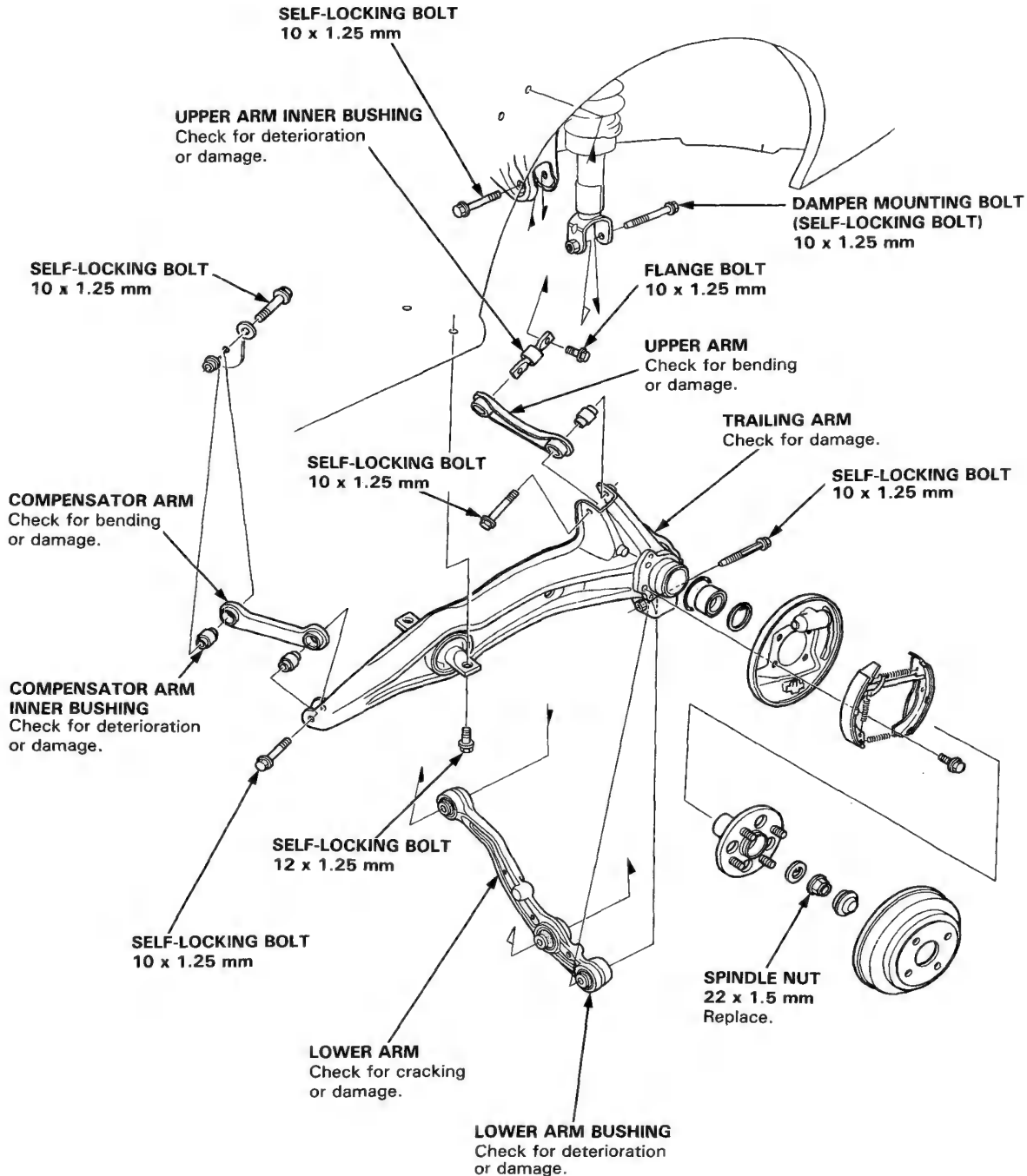
Rear Suspension

Suspension Arms (4WD)

Removal/Inspection

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).





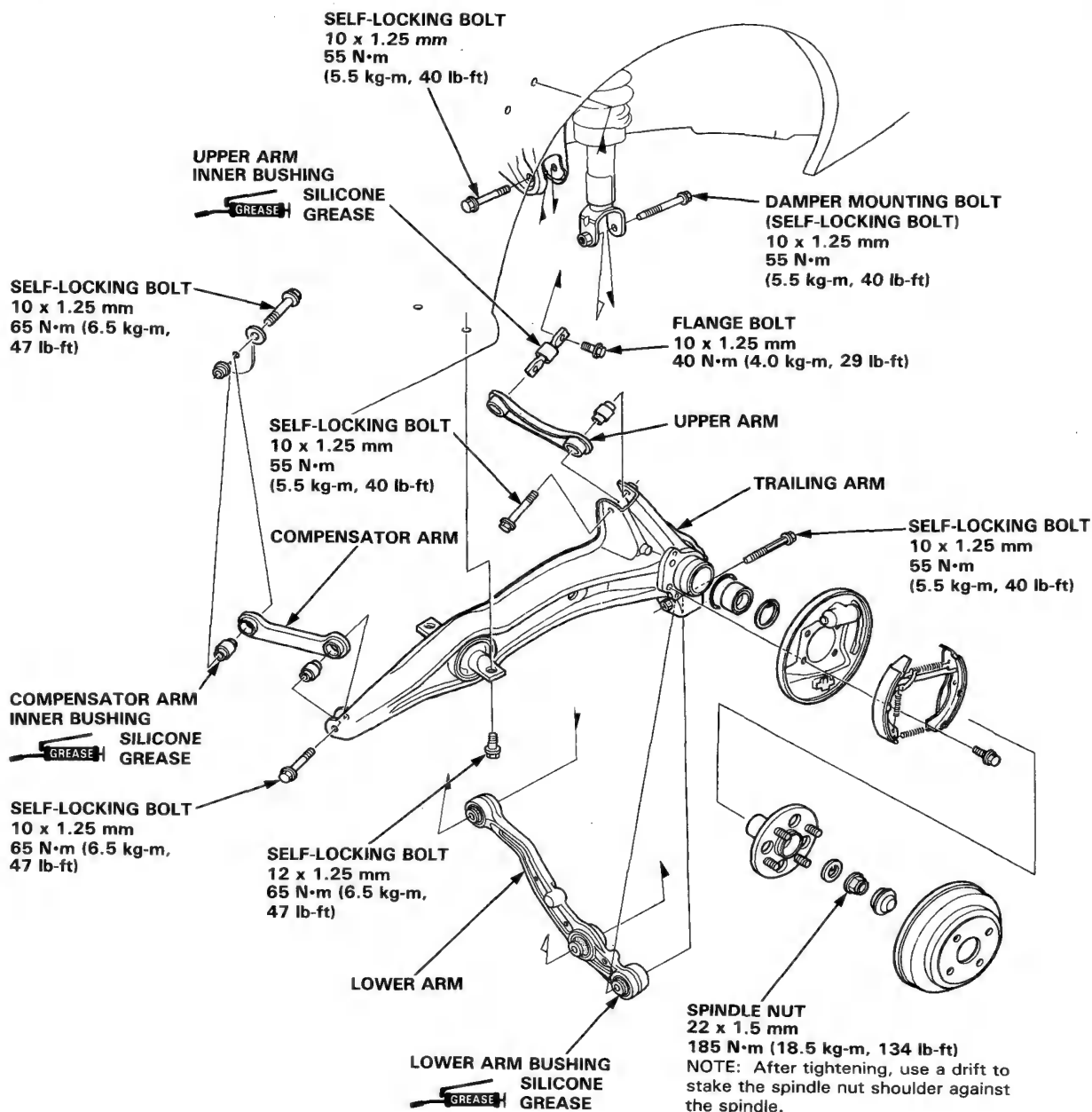
Suspension Arms (4WD)

Installation

NOTE:

- Make sure the toe adjusting bolts on the compensator arm are installed in the same direction.
- "L" or "LHG" is stamped on the left lower arm and "R" or "RHG" on the right lower arm.
- "↑ UP LH Z G" or "↑ UP LK" is stamped on the left upper arm and "↑ UP RH Z G" or "↑ UP RK" on the right upper arm.
- The right and left compensator arm are symmetrical. Install so the "UP ↑" mark points to the front.
- After installing the suspension arm, check the wheel alignment and adjust if necessary.

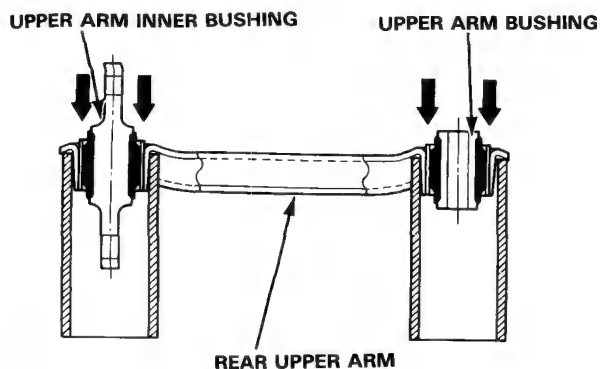
CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing are tightened.



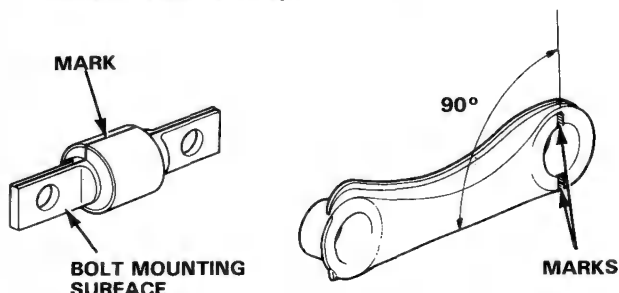
Rear Suspension

Upper Arm Bushing Replacement

1. Remove the upper arm bushing and inner bushing as shown.

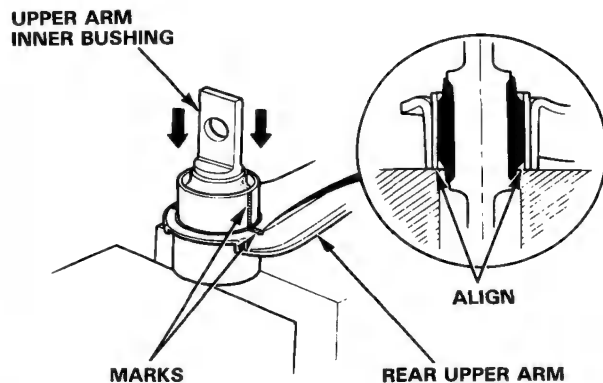


2. Mark a scribe line on the upper arm inner bushing so that it is in line with the bolt mounting surface.
3. Mark on the upper arm at two points so that they are in line and make a right angle with the arm as shown in the drawing.



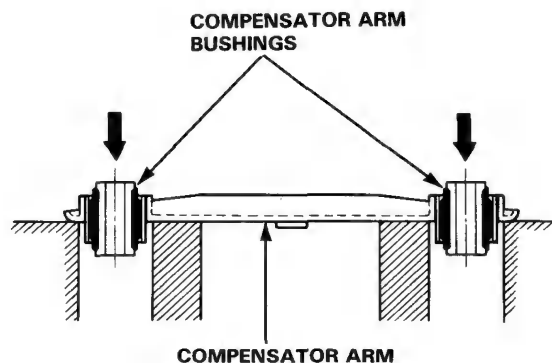
4. Drive in the upper arm inner bushing with the marks aligned.
5. Drive the upper arm bushing into the upper arm.

NOTE: Drive in the upper arm bushing and inner bushing until their leading edges are flush with the upper arm.



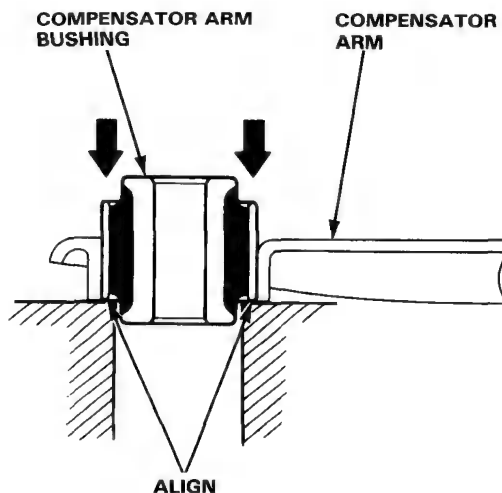
Compensator Arm Bushing Replacement

1. Drive the compensator arm bushing out of the compensator from the direction indicated.



2. Drive in the compensator arm bushings from the direction indicated.

NOTE: Drive in the compensator arm bushings so that their leading edges are flush with the compensator arm.

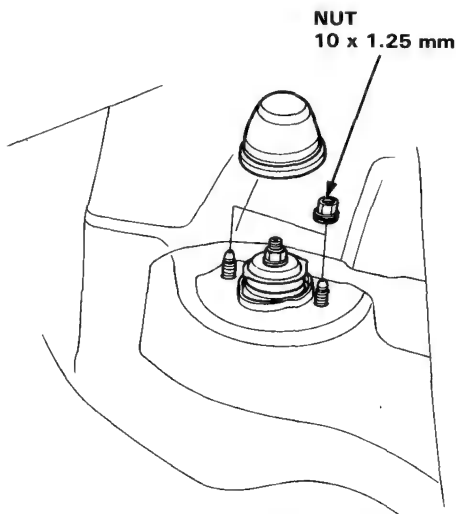


Rear Damper



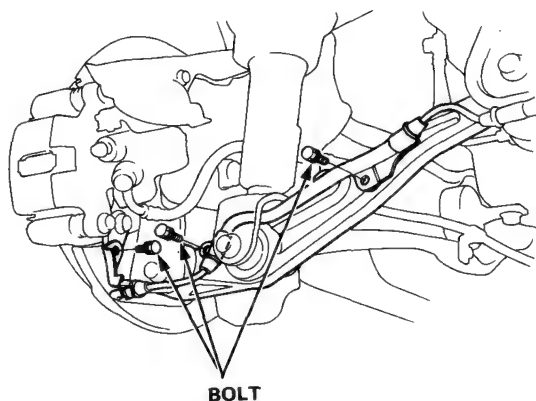
Removal

1. Jack up the rear of car and support on safety stands in proper locations.
2. Remove the damper upper cover at the rear seat lining.
3. Remove the two nuts.



4. Remove the speed sensor wire bracket (lower arm type A).

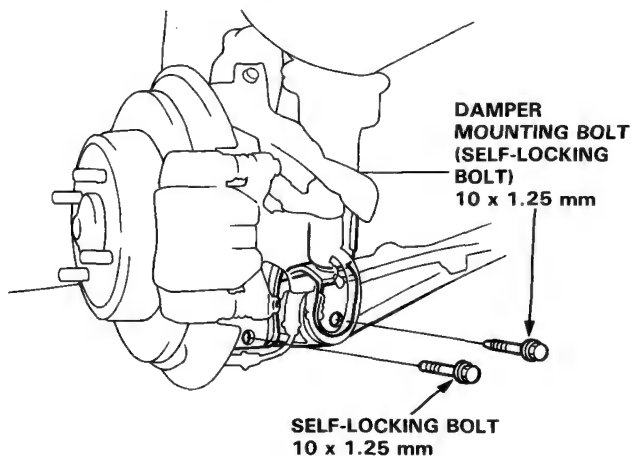
NOTE: Do not disconnect the speed sensor.



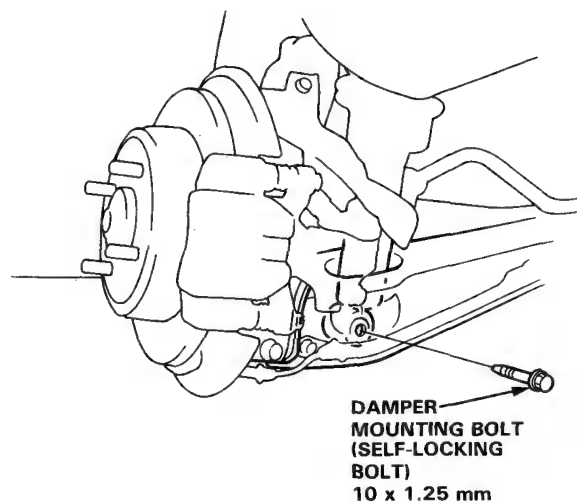
5. Remove the damper mounting bolt.
6. Remove the self-locking bolt (lower arm type A).

CAUTION: Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts.
(It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).

Lower Arm Type A:



Lower Arm Type B:



7. Lower the rear suspension and remove the damper assembly.

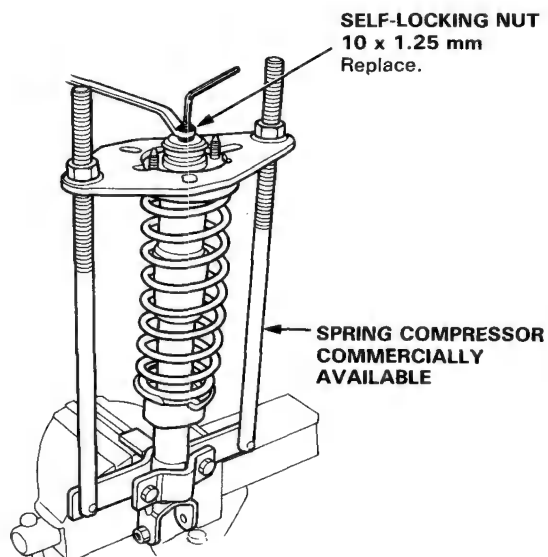
Rear Damper

Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions.

CAUTION: Do not compress the spring more than necessary to remove the self-locking nut.

2. Remove the self-locking nut from the damper assembly.

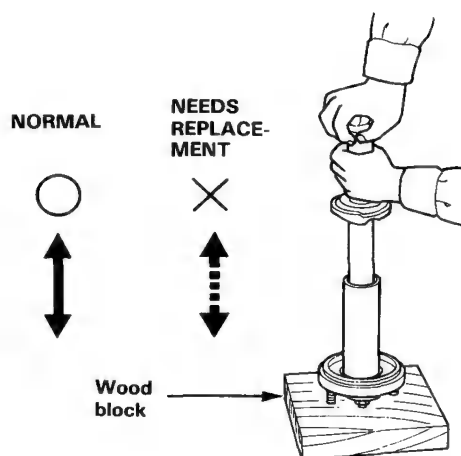


3. Remove the spring compressor and disassembly the damper as shown on page 18-43.

Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper assembly as shown.
3. Check for smooth operation through a full stroke, both compression and extension.

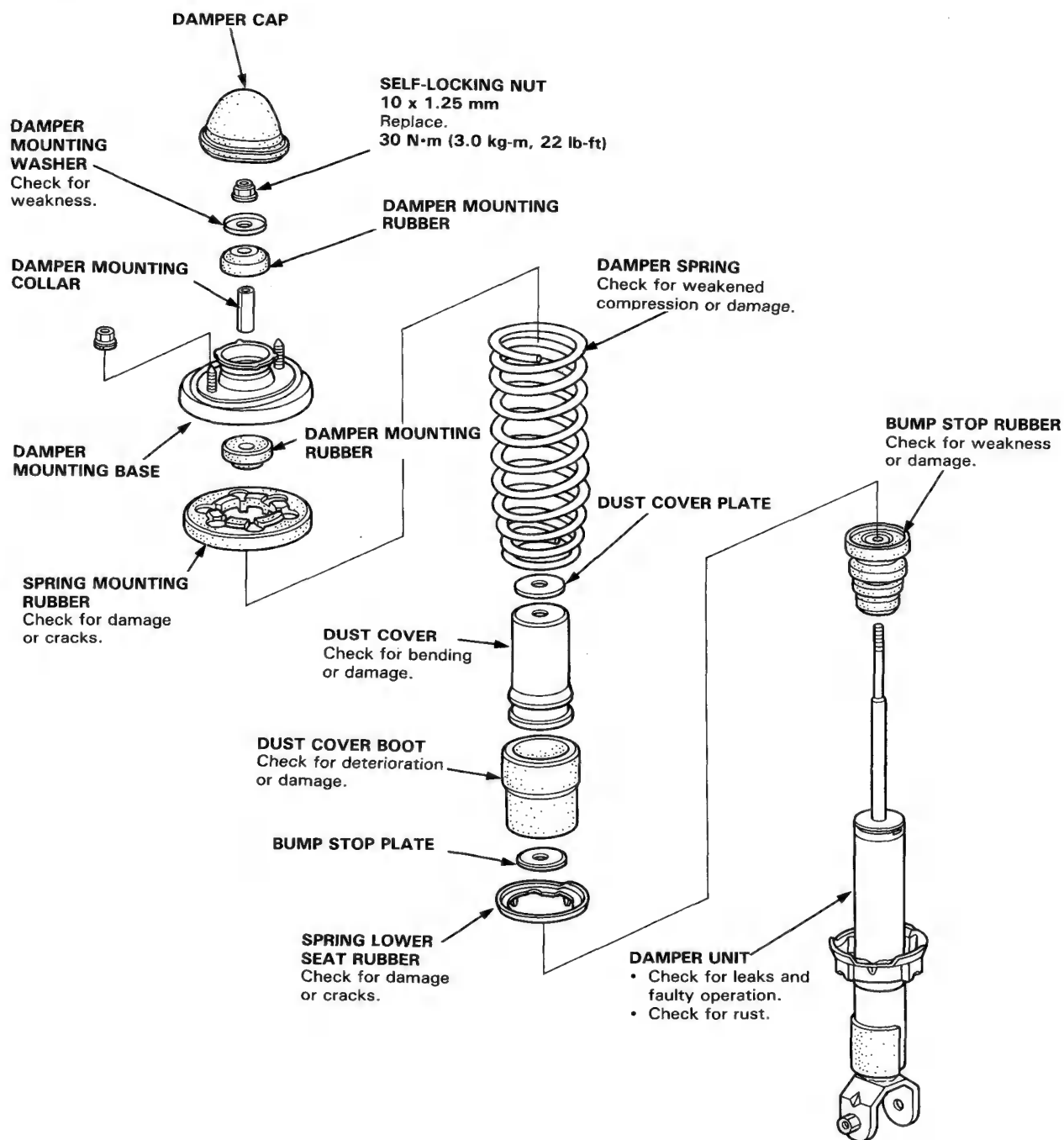
NOTE: The damper should move smoothly. If it does not (no compression or no extension), then gas is leaking, and the damper should be replaced.



4. Check for oil leaks, abnormal noises or binding during these tests.



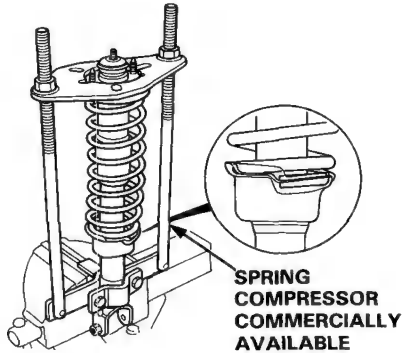
Inspection



Rear Damper

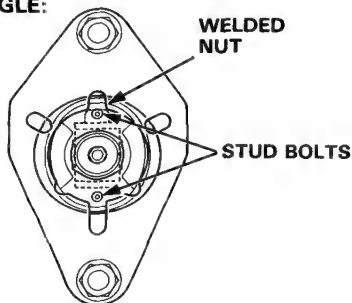
Reassembly

1. Install the damper unit on a spring compressor.
2. Install the spring lower seat rubber, bump stop, bump stop plate, dust cover boot, dust cover, dust cover plate, damper spring, damper mounting collar, damper mounting rubber, spring mounting rubber and damper mounting base on the damper unit.



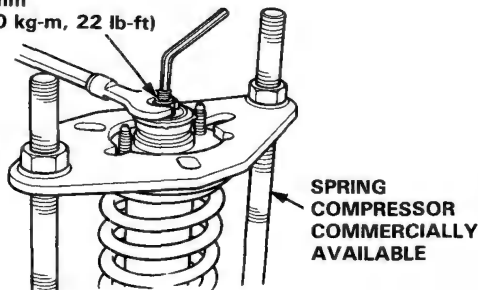
CAUTION: Install the damper mounting base so that the angle of the stud bolts is as shown.

STUD BOLTS ANGLE:



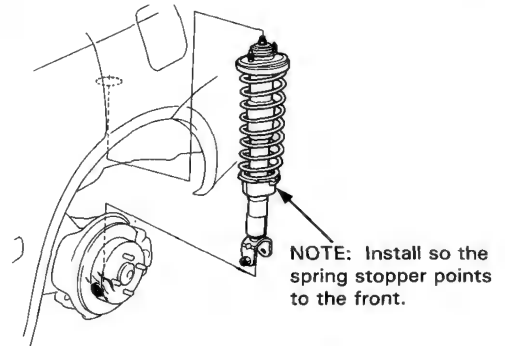
3. Compress the damper spring.
4. Install the damper mounting rubber and damper mounting washer, and loosely install a new self-locking nut.
5. Hold the damper shaft and tighten the self-locking nut.

SELF-LOCKING NUT
10 x 1.25 mm
30 N·m (3.0 kg-m, 22 lb-ft)

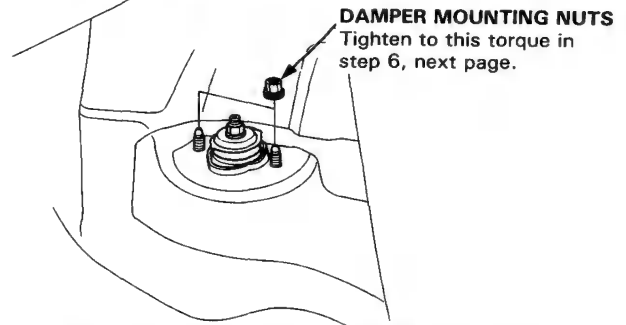


Installation

1. Lower the rear suspension and set the damper assembly.

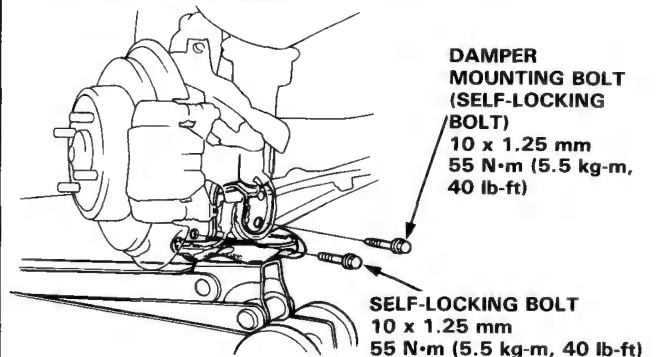


2. Loosely install the damper mounting nuts.



3. Install the speed sensor wire bracket (lower arm type A).
NOTE: Be careful when installing the sensors to avoid twisting wires.
4. Raise the rear suspension with a floor jack until the weight of the car is on the damper.
5. Install the damper mounting bolt and the self-locking bolt, then tighten the bolts.

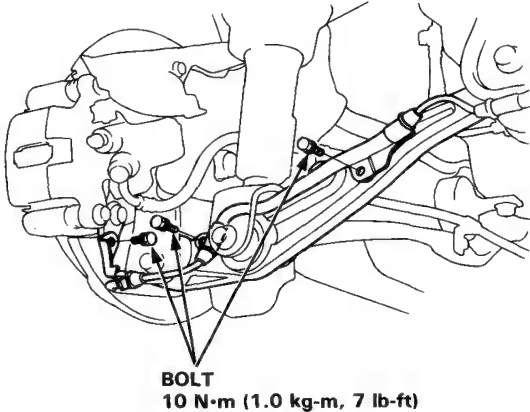
NOTE: The damper mounting bolt and the self-locking bolt should be tightened with the damper under vehicle load.



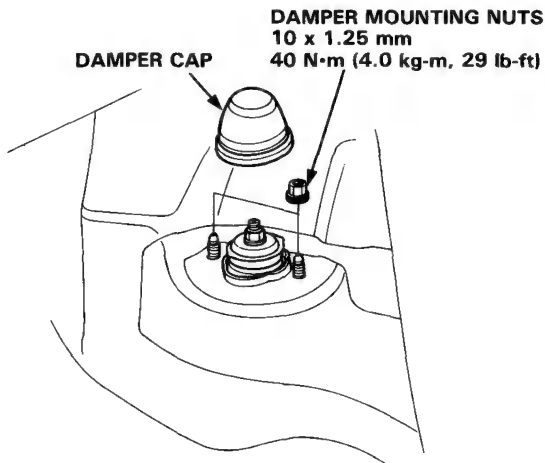


Damper Disposal

6. Tighten the speed sensor wire bracket bolts (lower arm type A).



7. Tighten the damper mounting nuts.
8. Install the damper cap.



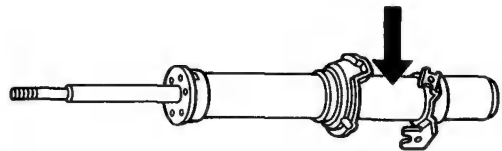
9. Check the rear wheel alignment and adjust if necessary (see 18-5).

⚠ WARNING The dampers contain nitrogen gas and oil under pressure.

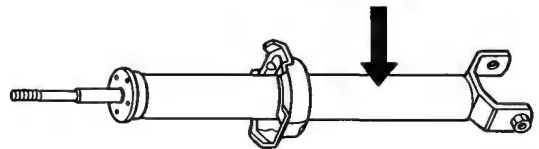
The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.

Place the damper on a level surface with its rod extended and drill a hole of 2–3 mm (0.078–0.118 in) diameter in the body to release the gas.

Front Damper



Rear Damper



⚠ WARNING Always wear eye protection to avoid getting metal shavings in your eyes when the gas damper pressure is relieved.

Brakes

Conventional Brakes	19-1
Anti-Lock Brake System	19-39



Conventional Brakes

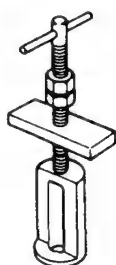
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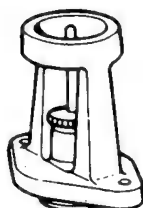
Special Tools

* Cars with ABS

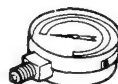
Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	✓07HAE—SG00100	Brake Spring Compressor	1	19-26, 19-29
②	✓07JAG—SD40100	Pushrod Adjustment Gauge	1	19-20
③	✓07404—5790300	Vacuum Gauge	1	19-18, 19-19
④	✓07406—5790200	Pressure Gauges	2	19-19
⑤	✓07410—5790100	Pressure Gauge Attachment C	1	19-19
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⑨	✓07914—SA50000	Snap Ring Pliers	1	19-26, 19-29
⑩	✓07916—6390001	Locknut Wrench	1	19-25, 19-30



①



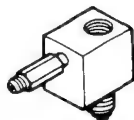
②



③



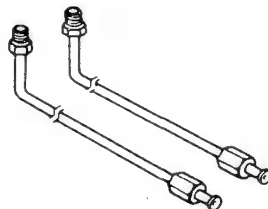
④



⑤



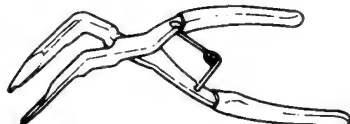
⑥



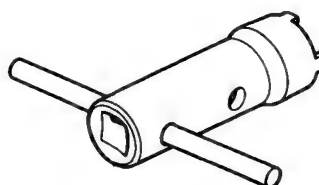
⑦



⑧



⑨



⑩



MASTER CYLINDER AND BRAKE BOOSTER

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Master Cylinder, page 19-15

Brake Booster 19-18

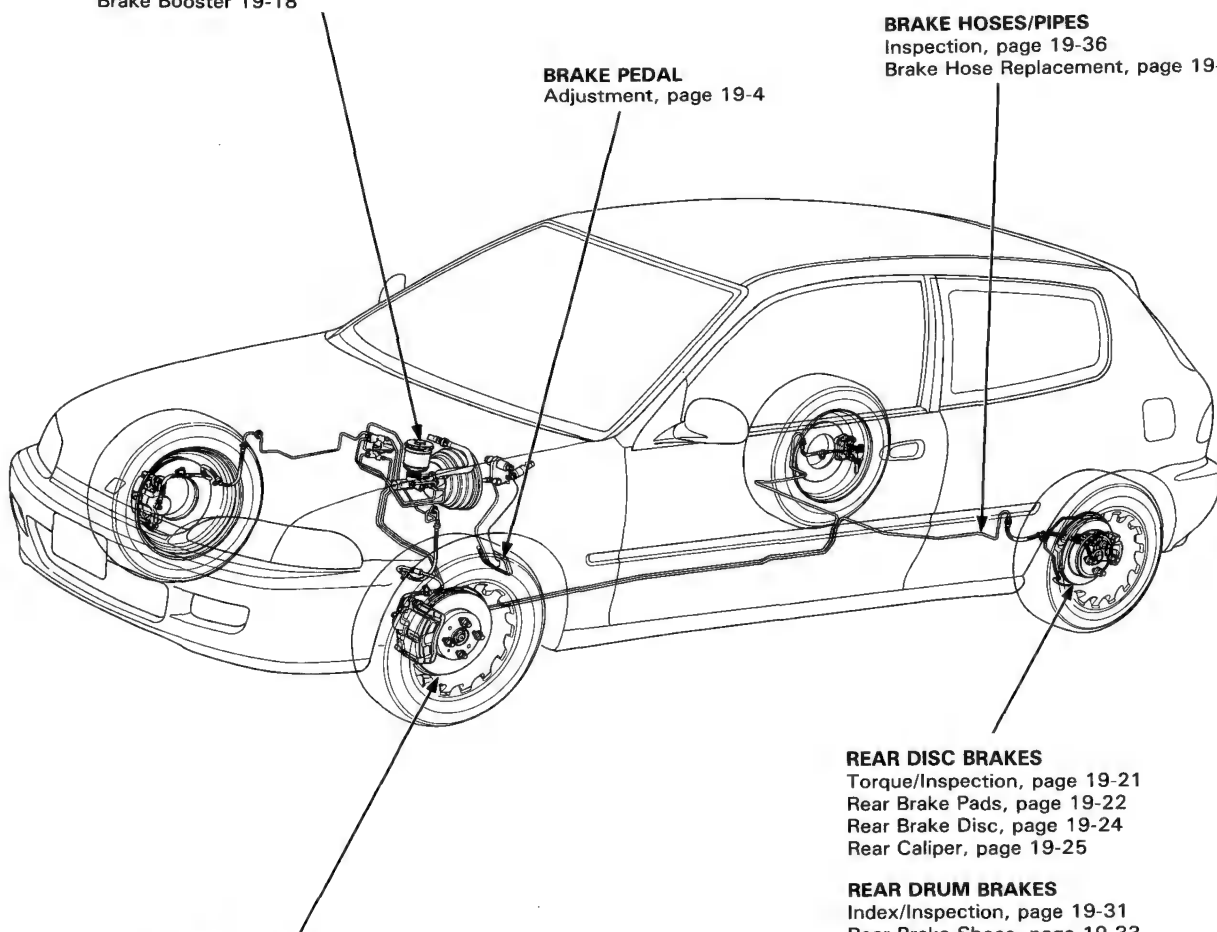
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BRAKE HOSES/PIPES

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FRONT BRAKES

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REAR DISC BRAKES

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REAR DRUM BRAKES

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PARKING BRAKE

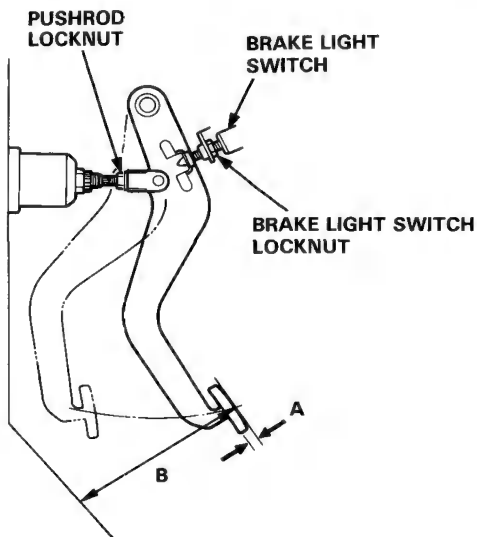
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page 19-38

Pedal Height

Adjustment

1. Disconnect the brake light switch connector, loosen the brake light switch locknut and back off the brake light switch until it is no longer touching the brake pedal.



A: Pedal Play

1—5 mm (1/16—13/64 in)

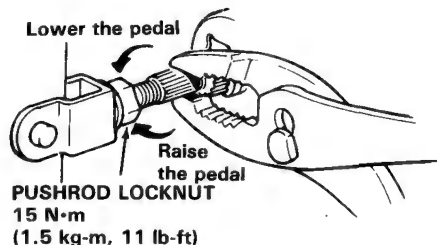
B: Standard Pedal Height

MT: 160 mm (6.30 in)

AT: 165 mm (6.50 in)

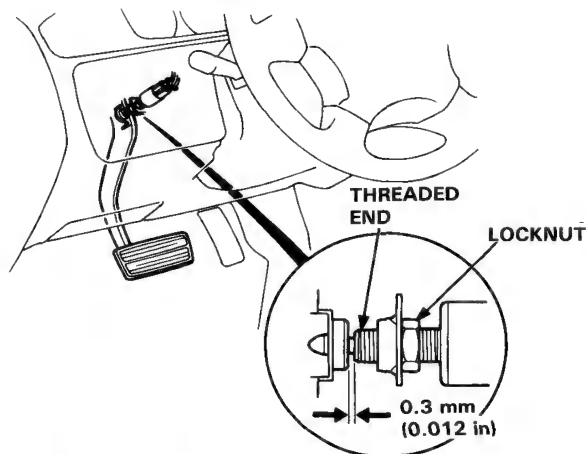
(with floor mat removed)

2. Loosen the pushrod locknut and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly.



3. Screw in the brake light switch until its plunger is fully depressed (threaded end touching the pad on the pedal arm). Then back off the switch 1/4 turn to make 0.3 mm (0.012 in) of clearance between the threaded end and pad. Tighten the locknut firmly. Connect the brake light switch connector.

CAUTION: Check that the brake lights go off when the pedal is released.



Brake Pedal Play Inspection:

Stop the engine and inspect the play by pushing the pedal by hand.

Brake Pedal Play: 1—5 mm (1/16—13/64 in)

NOTE: Do not adjust the pedal height with the pushrod depressed.

CAUTION: If the pedal free play is out of specification, brake drag may occur.

Parking Brake

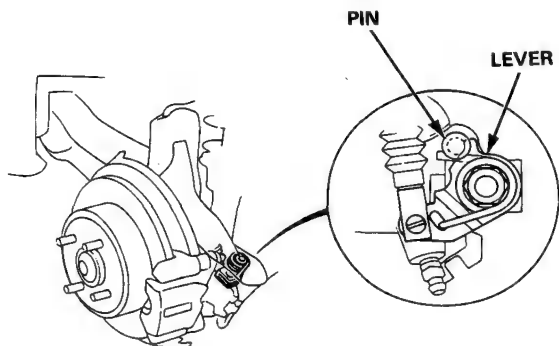


Adjustment

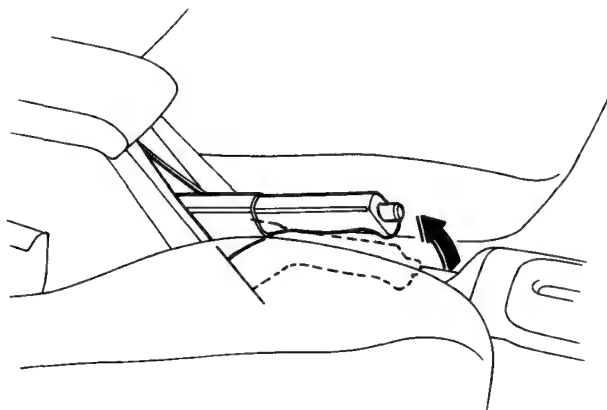
NOTE: After rear brake caliper or shoe servicing, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

⚠ WARNING Block the front wheels before jacking up the rear of the car.

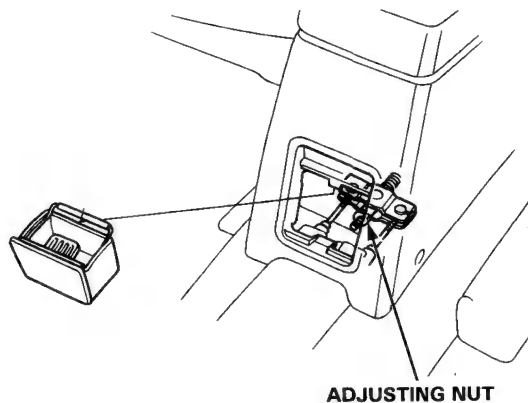
1. Raise the rear wheels off the ground.
2. On cars with rear disc brakes, make sure the lever of the rear brake caliper contacts the brake caliper pin.



3. Pull the parking brake lever up one notch.



4. Tighten the adjusting nut until the rear wheels drag slightly when turned.



5. Release the parking brake lever and check that the rear wheels do not drag when turned. Readjust if necessary.
6. With the equalizer properly adjusted, the rear brakes should be fully applied when the parking brake lever is pulled up 6 to 10 clicks.

Front Brakes

Torque/Inspection

⚠ WARNING



- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.

CAUTION:

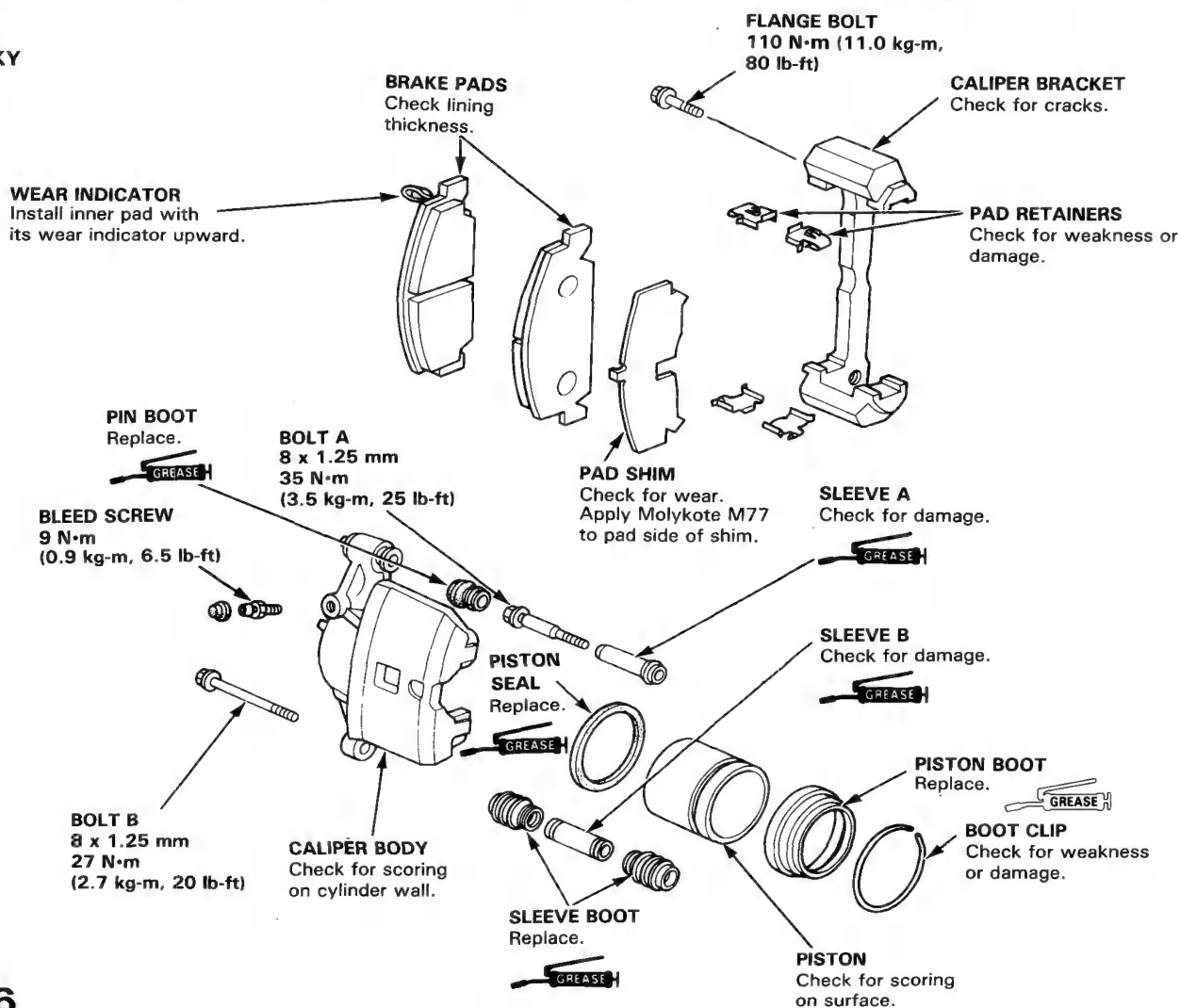
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE:

- Coat piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

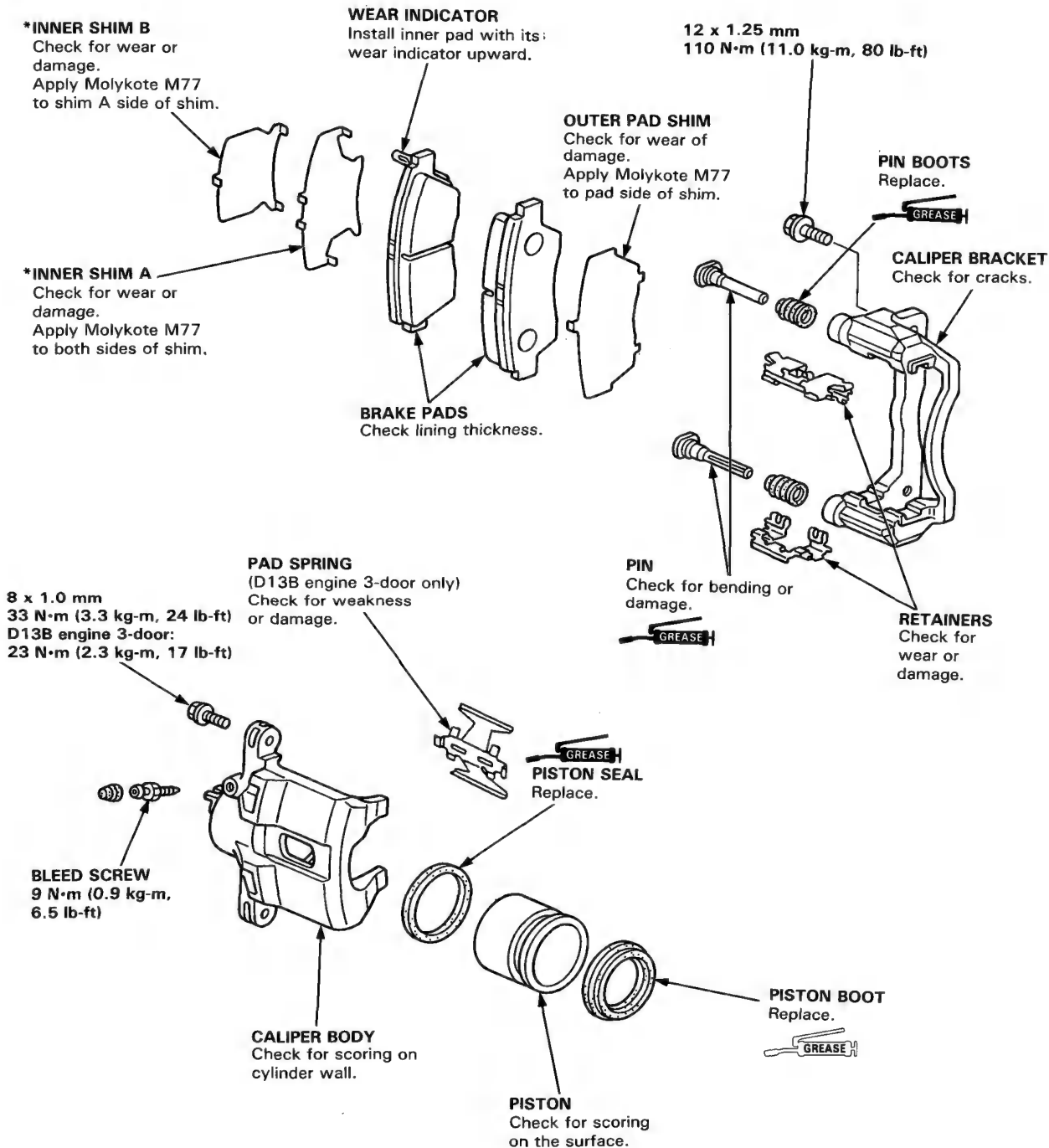
 : Brake Cylinder Grease (P/N: 08733-B020E) or equivalent rubber grease.  : Silicone grease.

KQ, KY





Except KQ, KY



*Except for D13B engine 3-door, B16A2, D16Z7 engines.

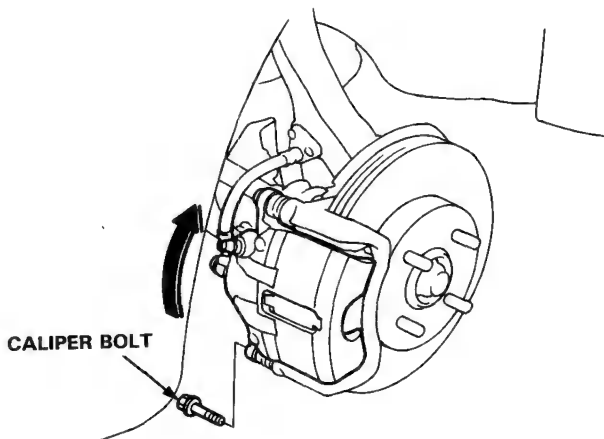
Front Brake Pads

Inspection/Replacement

⚠ WARNING

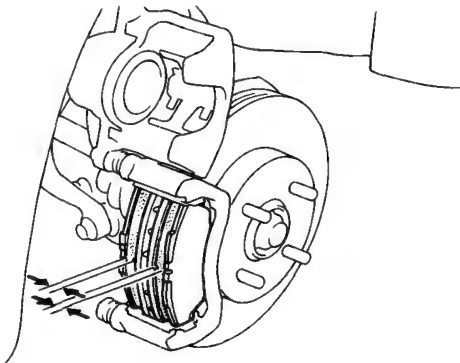
- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

1. Loosen the front wheel lug nuts slightly, then raise the car and support on safety stands.
2. Remove the caliper bolt and pivot the caliper up out of the way.



3. If the brake pad thickness is less than service limit at step 5, replace the front pads as a set.

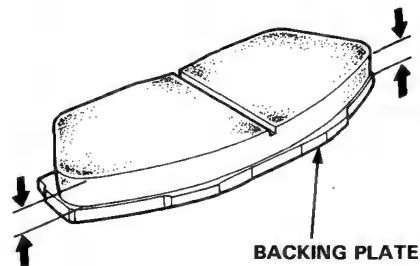
NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.



4. Remove the pad shims, pad retainers and pads.
5. Using vernier calipers, measure the thickness of each brake pad lining.

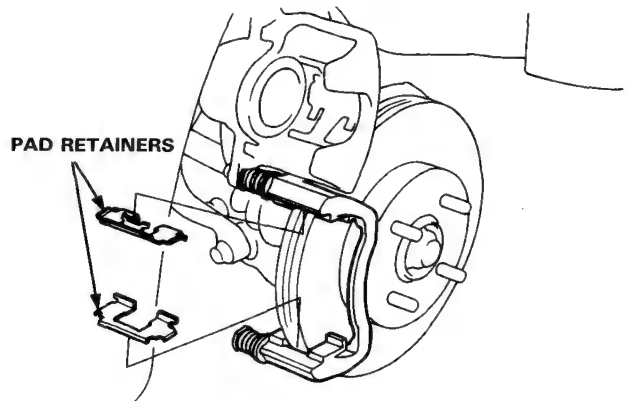
Brake Pad Thickness:

Standard: 9.0 mm (0.35 in)
D13B engine 3-door except KQ:
9.5 mm (0.37 in)
B16A2, D16Z7 engines:
10.0 mm (0.39 in)
Service Limit: 1.6 mm (0.06 in)



NOTE: Measurement does not include pad backing plate thickness.

6. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
7. Install the pad retainers.





Front Caliper Disassembly

8. Apply Molykote M77 compound to the pad shims and the back of the pads. Wipe off excess.

9. Install the brake pads and pad shims correctly.

⚠ WARNING

- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

NOTE: Install the pad with the wear indicator on the inside.

INNER SHIM B (EX only)
Apply Molykote M77 to inner side of shim.

INNER SHIM A (EX only)
Apply Molykote M77 to both sides of shim.

OUTER PAD SHIM
Apply Molykote M77 to inner side of shim.

10. Push in the piston so that the caliper will fit over the pads. Keep the boot in position to prevent damaging the boot when pivoting the caliper down.

11. Pivot the caliper down into position, then install the caliper bolt (flange bolt) and the brake hose bracket bolts. Tighten the bolts.

CALIPER BOLT
33 N·m
(3.3 kg-m,
24 lb-ft)
D13B engine 3-door:
23 N·m (2.3 kg-m,
17 lb-ft)
KQ, KY:
27 N·m
(2.7 kg-m,
20 lb-ft)

NOTE: Make sure the pin is clean before installation, then apply a clean silicone grease to the inside of the boot and the pin.

12. Depress the brake pedal several times to make sure the brakes work, then road-test.

CAUTION:

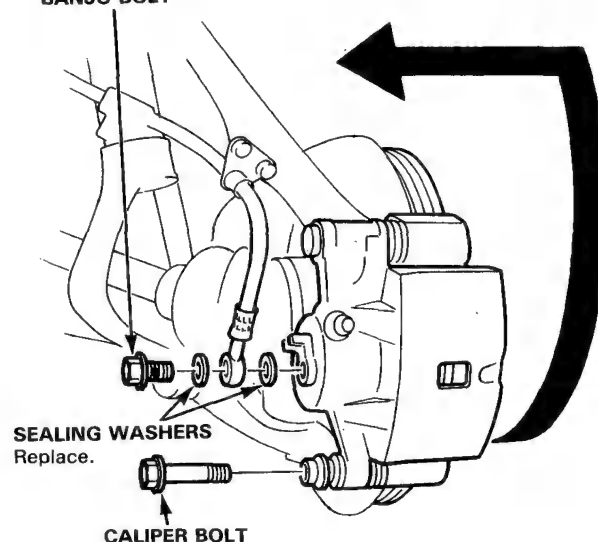
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

1. Remove the banjo bolt and disconnect the brake hose from the caliper.

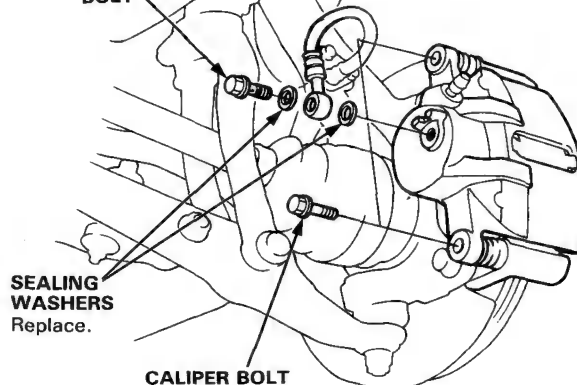
2. Remove the caliper bolt(s), then remove the caliper.

KQ, KY:

BANJO BOLT



Except KQ, KY
BANJO BOLT



(cont'd)

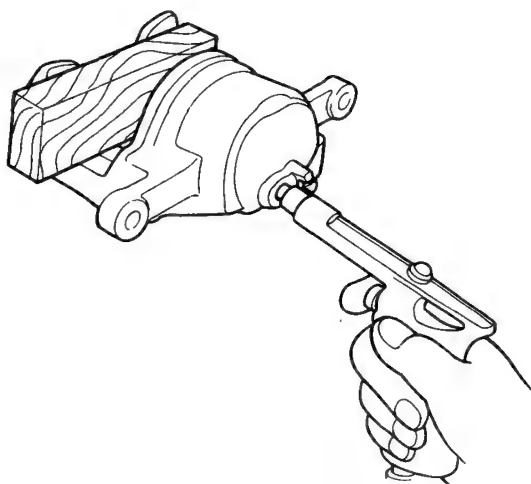
Front Caliper

Disassembly (cont'd)

3. On cars with ABS, remove the pad spring from the caliper body.
4. If necessary, apply compressed air to the caliper fluid inlet to get the piston out. Place a shop rag or wooden block as shown to cushion the piston when it is expelled. Use low pressure air in short spurts. Remove the piston from the caliper.

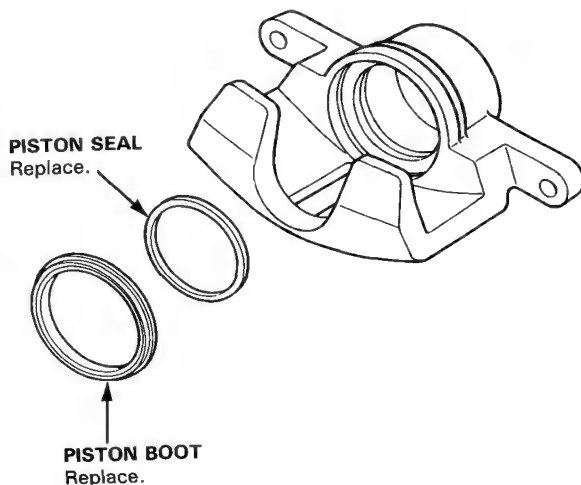
⚠ WARNING

- Do not place your fingers in front of the piston.
- Do not use high air pressure.



5. Remove the piston boot and piston seal.

CAUTION: Take care not to damage the cylinder.

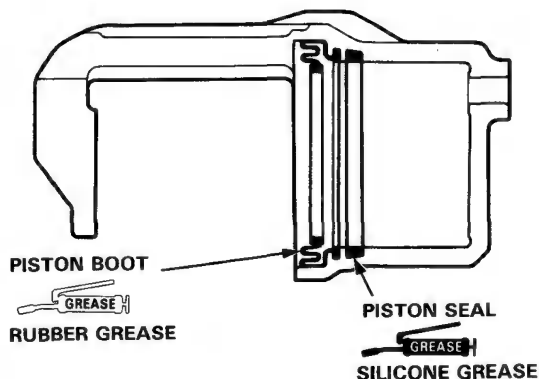


Reassembly

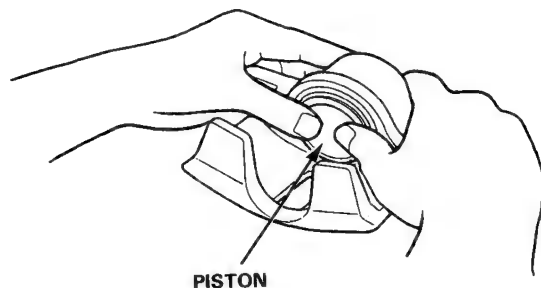
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

1. Clean the piston and caliper bore with brake fluid and inspect for wear or damage.
2. Coat a new piston seal with silicone grease and install it in the cylinder groove.
3. Apply Brake cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease to the sealing lips and inside of a new piston boot, and install the boot in the cylinder groove.

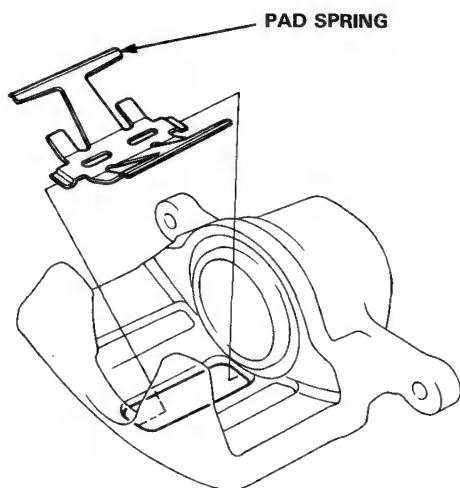


4. Lubricate the caliper cylinder and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.





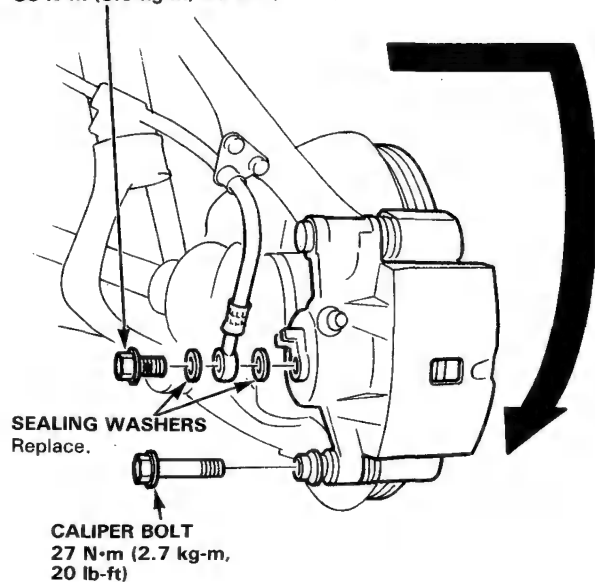
5. On D13B engine 3-door, install the pad spring.



6. Install the brake pad retainers and brake pads in their original positions.
7. Install the caliper on the caliper bracket and tighten the caliper bolts.
8. Connect the brake hose to the caliper with new sealing washers and tighten the banjo bolt.

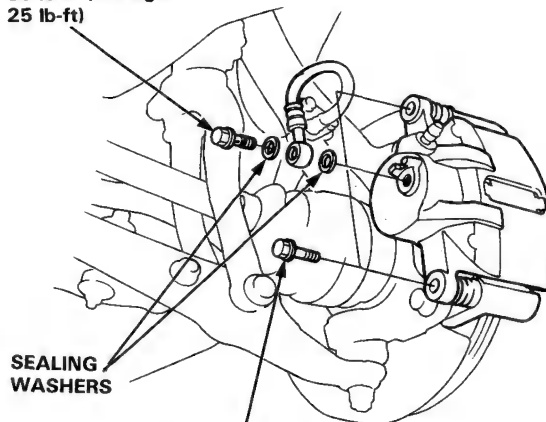
KQ, KY

35 N·m (3.5 kg-m, 25 lb-ft)



Except KQ, KY

BANJO BOLT
35 N·m (3.5 kg-m,
25 lb-ft)



CALIPER BOLT
33 N·m (3.3 kg-m,
24 lb-ft)
D13B engine 3-door:
23 N·m (2.3 kg-m,
17 lb-ft)

9. Fill the brake reservoir up and bleed the brake system (page 19-13).

Front Brake Disc

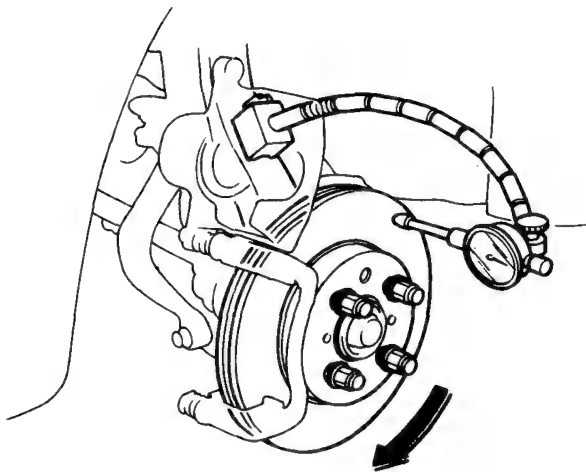
Runout Inspection

1. Loosen the front wheel lug nuts slightly, then raise the car and support on safety stands. Remove the front wheels.
2. Remove the brake pads (page 19-8).
3. Inspect the disc surface for cracks, and rust. Clean the disc thoroughly and remove all rust.
4. Use lug nuts and suitable plain washers to hold the disc securely against the hub, then mount a dial indicator as shown and measure the runout at 10 mm (0.39 in) from the outer edge of the disc.

Brake Disc Runout:

Service Limit: 0.1 mm (0.004 in)

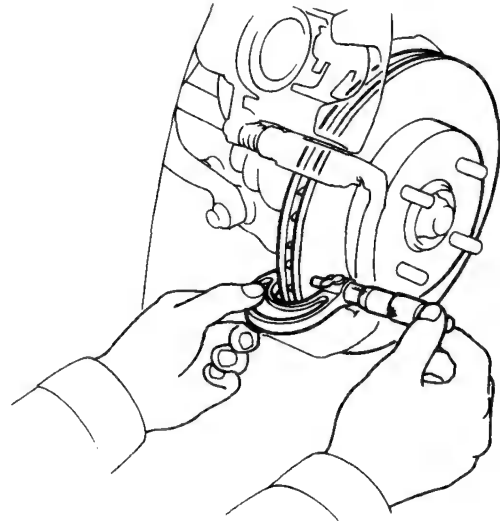
5. If the disc is beyond the service limit, refinish the rotor with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.



NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in).

Thickness and Parallelism Inspection

1. Loosen the front wheel lug nuts slightly, then raise the car and support on safety stands. Remove the front wheels.
2. Remove the brake pads (page 19-8).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.39 in) in from the outer edge of the disc.



Brake disc thickness:

Standard: 21 mm (0.827 in)

Max. Refinishing Limit: 19 mm (0.748 in)

D13B engine 3-door except KQ:

Standard: 17 mm (0.669 in)

Max. Refinishing Limit: 15 mm (0.591 in)

Brake Disc Parallelism:

The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in).

4. If the disc is beyond the service limit for thickness or parallelism, refinish the rotor with an on-car brake lathe. The Kwik-Lathe produced by Kwik-Way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

Bleeding



CAUTION:

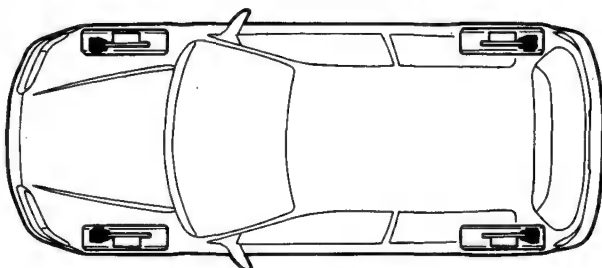
- Use only clean DOT 3 or 4 brake fluid.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not spill brake fluid on the car, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

NOTE: The reservoir on the master cylinder must be full at the start of bleeding procedure, and checked after bleeding each brake caliper. Add fluid as required. Use only clean DOT 3 or 4 brake fluid.

BLEEDING SEQUENCE

④ Front Right

① Rear Right

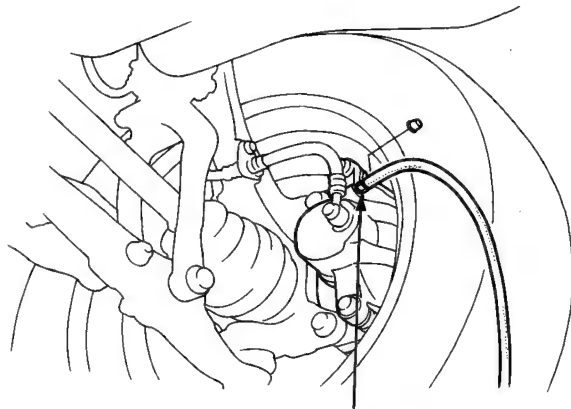


② Front Left

③ Rear Left

1. Have someone slowly pump the brake pedal several times, then apply steady pressure.
2. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
3. Repeat the procedure for each wheel in the sequence shown above, until air bubbles no longer appear in the fluid.

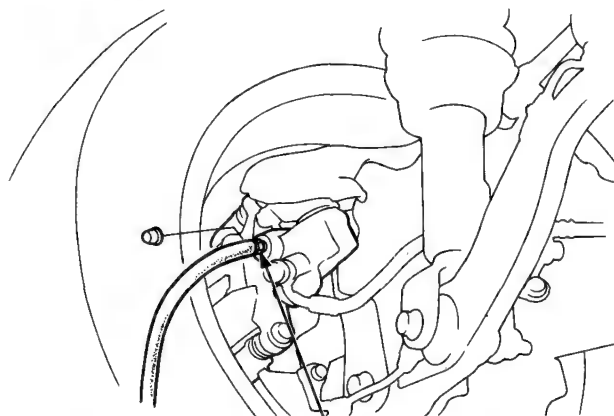
FRONT



9 N·m (0.9 kg-m, 6.5 lb-ft)

REAR

Disc Brake



9 N·m (0.9 kg-m, 6.5 lb-ft)

Drum Brake

7 N·m (0.7 kg-m, 5.1 lb-ft)



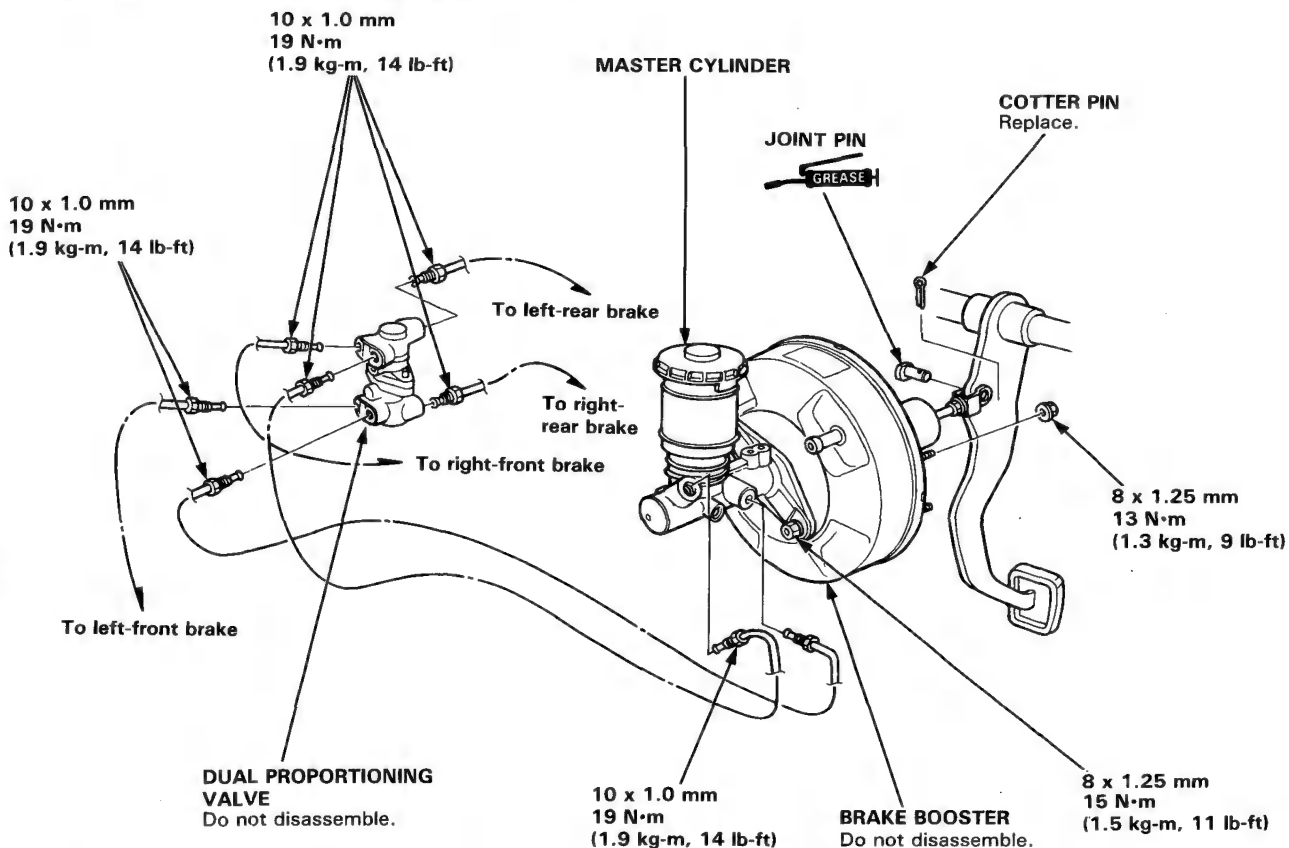
Master Cylinder and Brake Booster

Removal/Installation

CAUTION:

- Be careful not to bend or damage the brake pipes when removing the master cylinder.
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.
- Do not disassemble the booster. Replace it as complete assembly.

1. Drain the brake fluid from the master cylinder.
2. Disconnect the brake fluid level switch connectors.
3. Disconnect the brake pipes from the master cylinder.
4. Remove the master cylinder mounting nuts and the master cylinder.
5. Disconnect the vacuum hose from the brake booster and remove the check valve bracket.
6. Remove the cotter pin and joint pin.
7. Remove the booster mounting nuts and the brake booster.



8. Install the brake booster and master cylinder in the reverse order of removal.

NOTE: Before installing the master cylinder, check and adjust the pushrod clearance.

9. After installation, check and adjust the brake pedal height (page 19-4).
10. Fill and bleed the brake system (page 19-13).

Master Cylinder

Index/Inspection





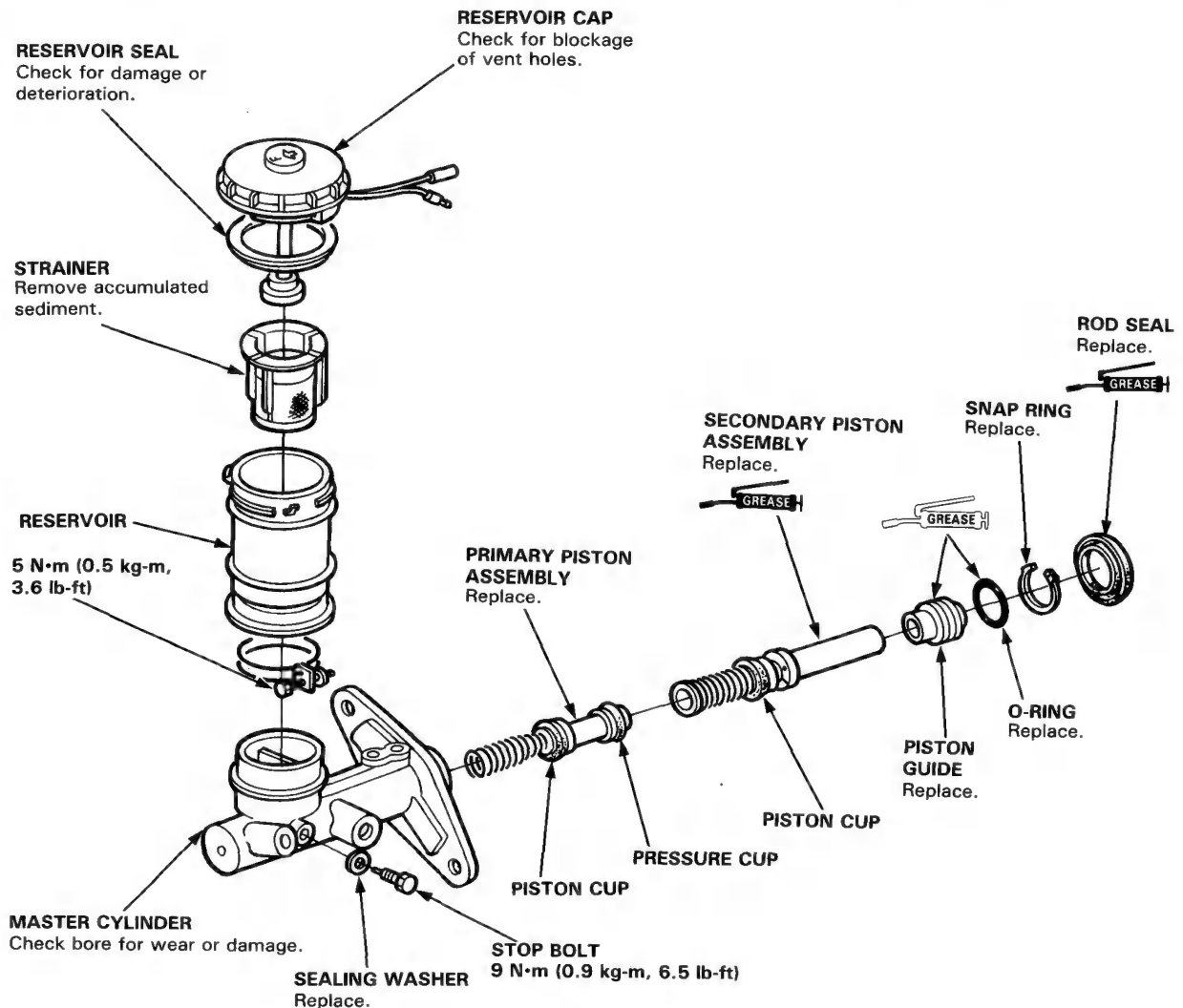
CAUTION:

- Do not spill brake fluid on the car, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.

NOTE:

- Coat piston cup, pressure cup and master cylinder bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

 : Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease.  : Silicone grease.



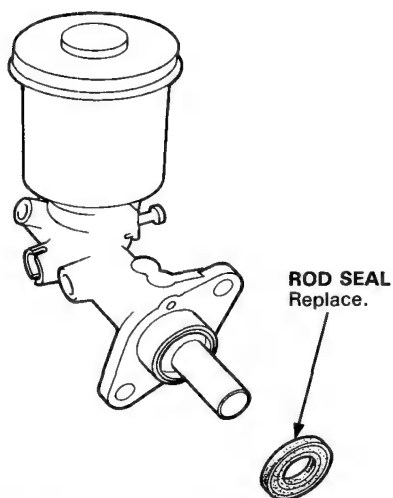
Master Cylinder

Disassembly

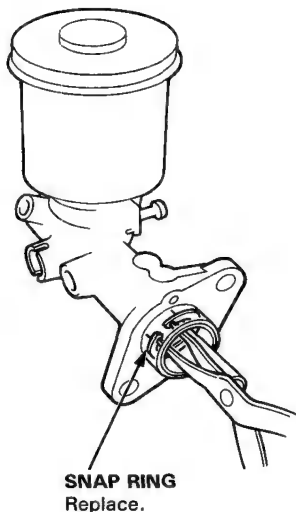
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

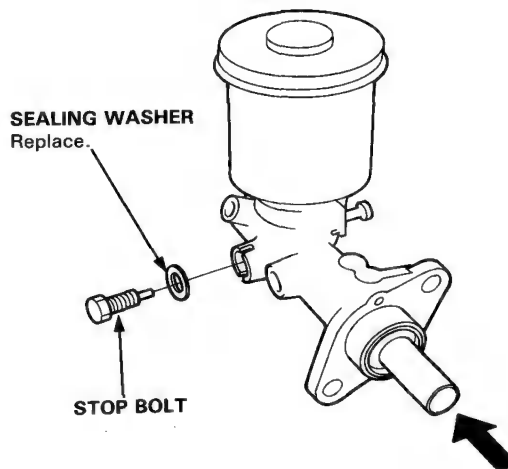
1. Remove the rod seal.



2. Push the secondary piston assembly, then remove the snap ring.



3. Remove the stop bolt while pushing in the secondary piston assembly.



4. Remove the piston guide, secondary piston assembly and primary piston assembly.

NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side port.

CAUTION:

- Do not use high pressure air or bring the nozzle too close to the port.
- Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.

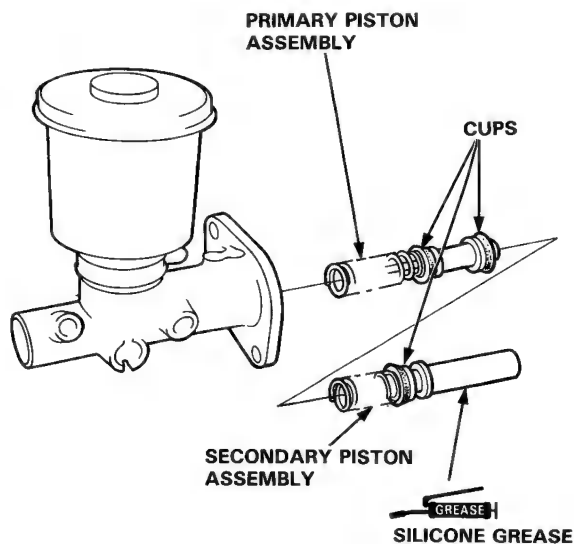


Reassembly

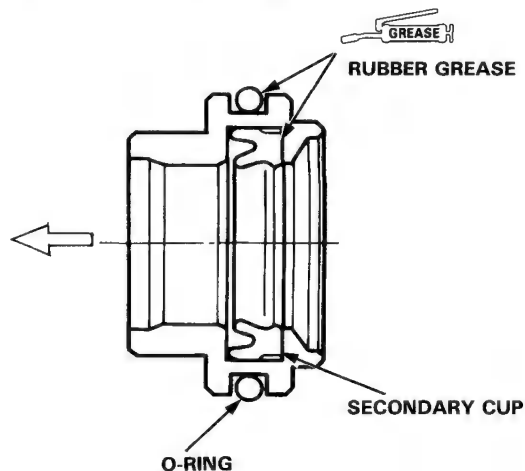
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

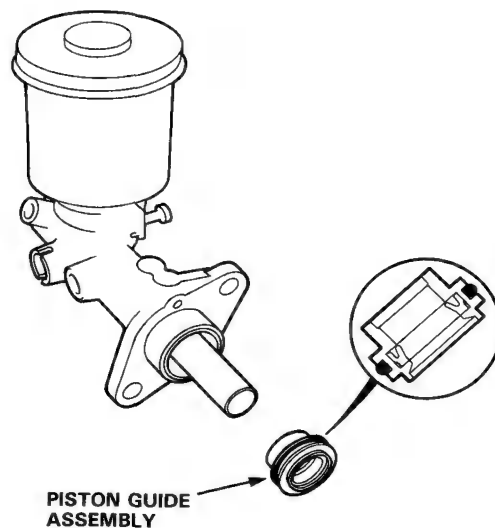
1. Apply silicone grease to a new secondary piston.
2. Lubricate the cups of new primary and secondary piston assemblies with brake fluid, and install them into the master cylinder.



3. Apply Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease to a new O-ring and the secondary cup in a new piston guide and install the O-ring onto the piston guide.



4. Install the piston guide assembly into the master cylinder.

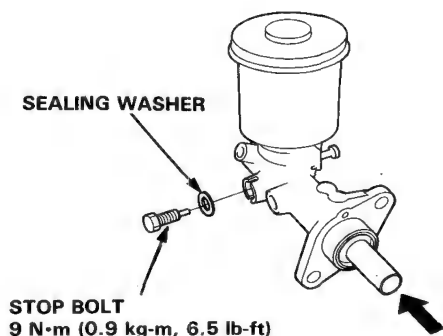


(cont'd)

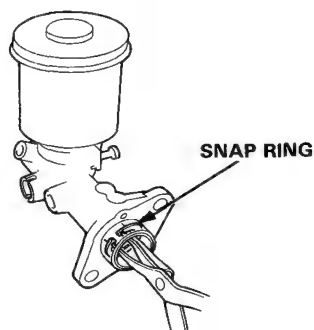
Master Cylinder

Reassembly (cont'd)

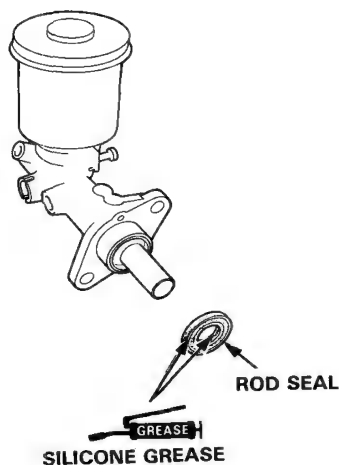
5. Install the stop bolt with a new sealing washer while pushing in the secondary piston, and tighten the stop bolt.



6. Install a new snap ring while pushing in the secondary piston.



7. Apply silicone grease to a new rod seal and install the seal onto the master cylinder.

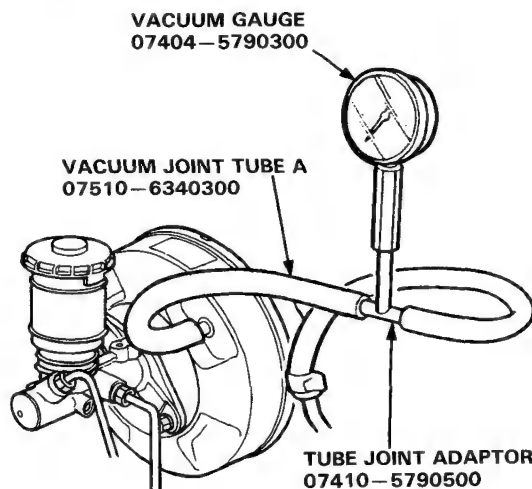


Brake Booster

Tests

Leak Test

1. Install the Brake Power Kit (07504-6340100) as shown.



2. Start the engine, adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 300–500 mmHg (11.8–19.7 in-Hg), then stop the engine.
3. Read the vacuum gauge.

If the vacuum readings decreases 20 mmHg (0.8 inHg) or more after 30 seconds, check following parts for leaks.

- Check valve
- Vacuum hose, pipe
- Seals
- Diaphragm
- Master cylinder rod seal and cup



Function Test

1. Install the vacuum gauge as same the leak test.
2. Connect the oil pressure gauges to the master cylinder using the attachments as shown.
3. Bleed air through the valves.

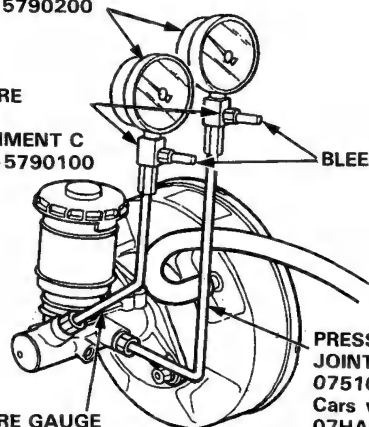
PRESSURE GAUGES
07406-5790200

PRESSURE GAUGE ATTACHMENT C
07410-5790100

BLEED VALVES

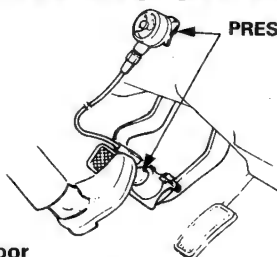
PRESSURE GAUGE JOINT PIPE
07510-6340101
Cars with ABS:
07HAK-SG00110

PRESSURE GAUGE JOINT PIPE
07510-6340101



4. Start the engine.
5. Depress the brake pedal with a 200 N (20 kg, 44 lbs) of pressure. The following pressures should be observed at the pressure gauges in each vacuum.

PRESSURE GAUGE



D13B engine 3-door

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm, psi)
0 (0)	152 (15.2, 216)
300 (11.8)	531 (53.1, 755)
500 (19.7)	788 (78.8, 1,120)

B16A2 engine without ABS

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm, psi)
0 (0)	131 (13.1, 186)
300 (11.8)	546 (54.6, 776)
500 (19.7)	765 (76.5, 1,088)

D16Z7 engine without ABS

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm, psi)
0 (0)	131 (13.1, 186)
300 (11.8)	546 (54.6, 776)
500 (19.7)	830 (83.0, 1,180)

Cars with ABS

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm, psi)
0 (0)	92 (9.2, 131)
300 (11.8)	557 (55.7, 762)
500 (19.7)	874 (87.4, 1,243)

Others

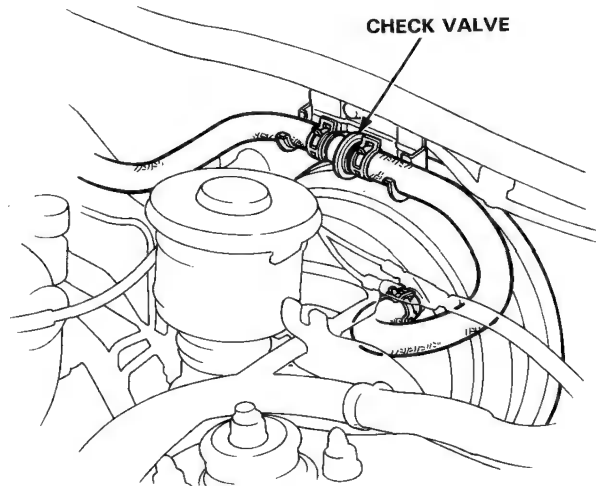
Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm, psi)
0 (0)	152 (15.2, 216)
300 (11.8)	638 (63.8, 907)
500 (19.7)	887 (88.7, 1,261)

6. Inspect the master cylinder pistons and cups if the readings do not fall within the limits shown above.

Check Valve Test

1. Disconnect the brake booster vacuum hose at the booster.
2. Start the engine and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working correctly. Replace the check valve and retest.

CHECK VALVE

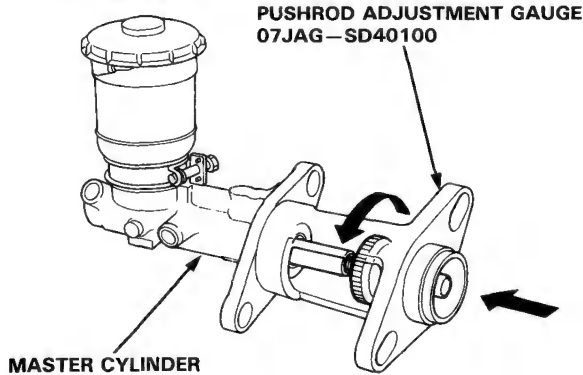


Brake Booster

Pushrod Clearance Adjustment

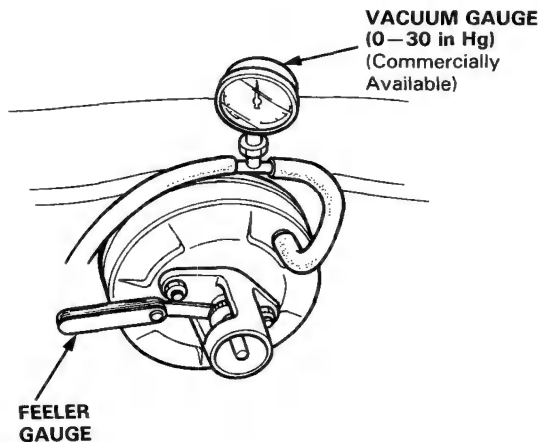
NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Set the special tool on the master cylinder body; push in the center shaft until the top of it contacts with the end of the secondary piston and lock it with locknut.

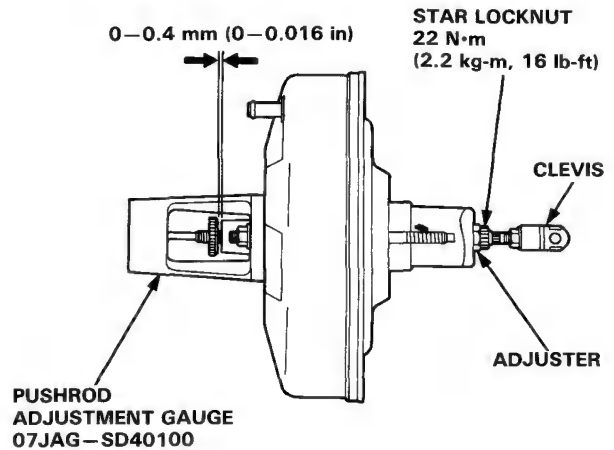


2. Without disturbing the adjusting bolt's position, install the special tool upside down on the booster.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge (0–30 in Hg) to the booster's engine vacuum supply, and maintain a engine speed that will deliver 500 mm Hg (20 in Hg) vacuum.
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut as shown.

Clearance: 0–0.4 mm (0–0.016 in)

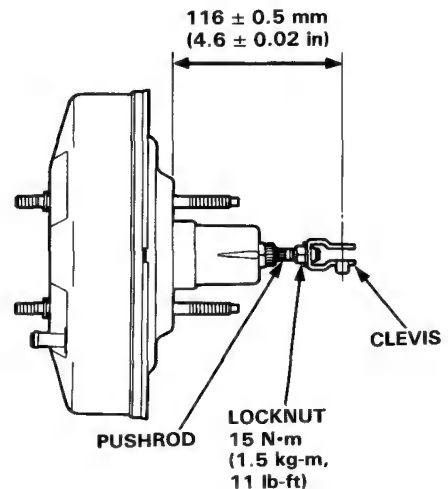


6. If clearance is incorrect, loosen the star locknut and turn the adjuster in or out to adjust. Hold the clevis while adjusting.
7. Tighten the star locknut securely. Remove the special tool and install a new master cylinder rod seal in the booster.



NOTE: If the clearance between the gauge body and adjusting nut is 0.4 mm, the pushrod-to-piston clearance is 0 mm. If the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm or more. Therefore, it must be adjusted and rechecked.

8. Adjust the pushrod length as shown if necessary.





Rear Disc Brakes

Torque/Inspection

⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passage with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE:

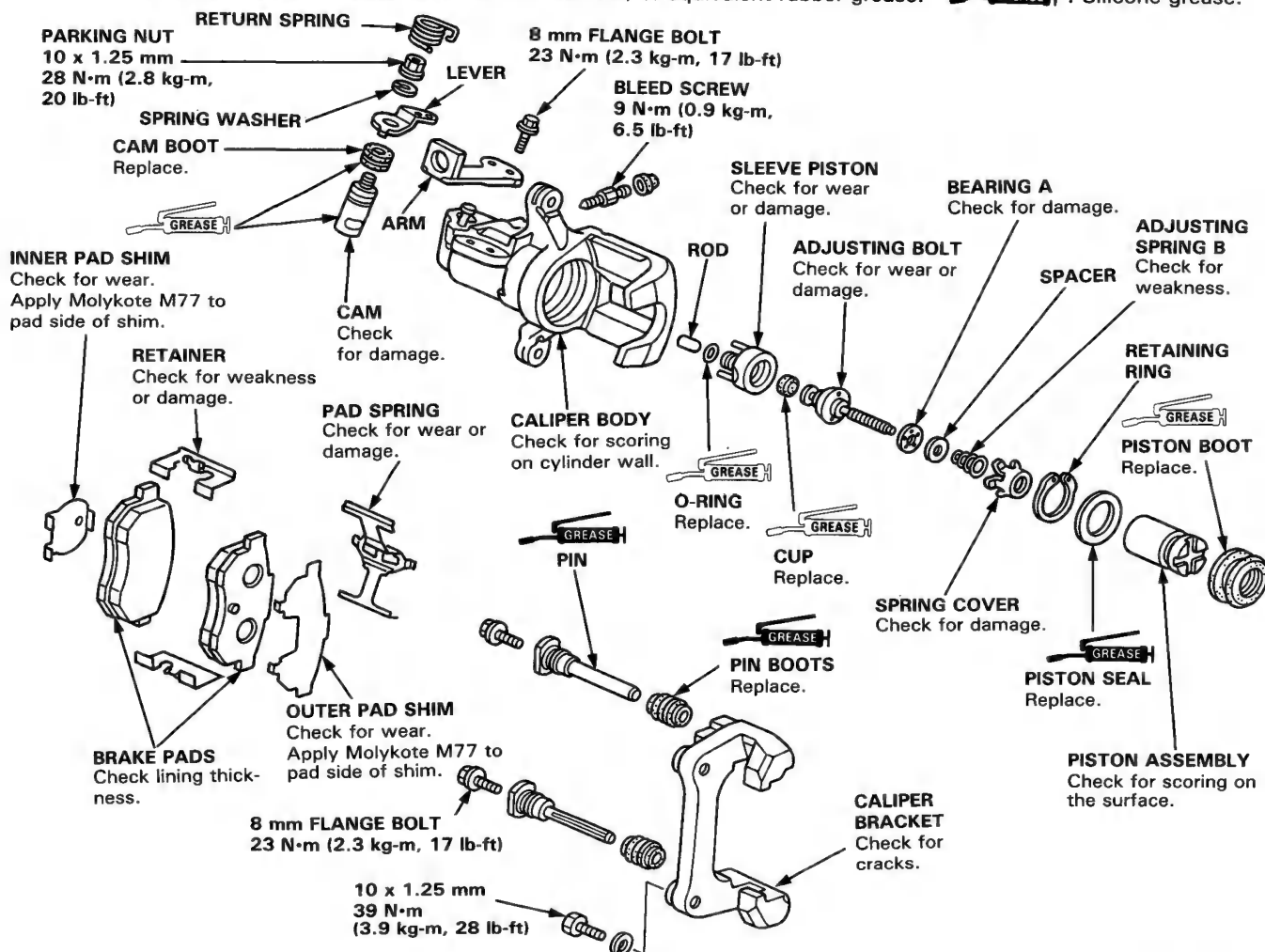
- Coat piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.



: Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease.



: Silicone grease.



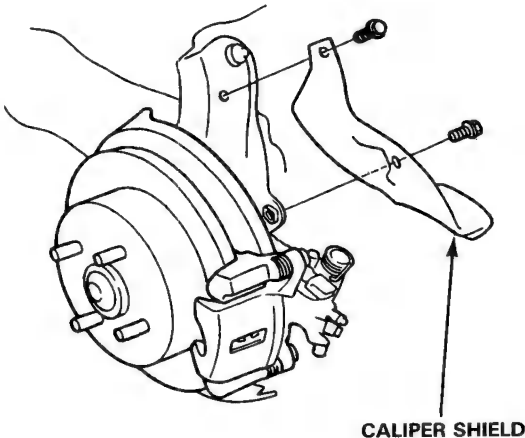
Rear Brake Pads

Inspection/Replacement

⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

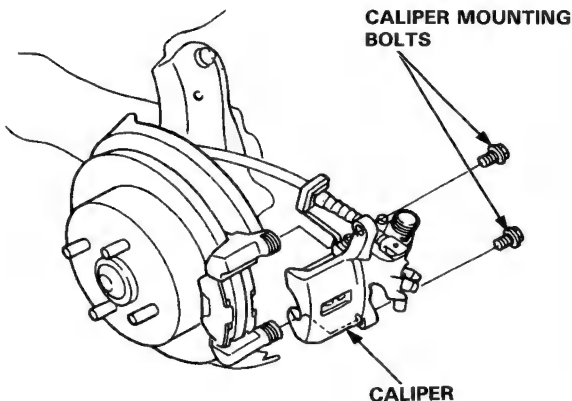
1. Block the front wheels, loosen the rear wheel lug nuts slightly, support the rear of car on safety stands, then remove the rear wheels. Release the parking brake.
2. Remove the caliper shield.



3. Remove the two caliper mounting bolts and the caliper from the bracket.

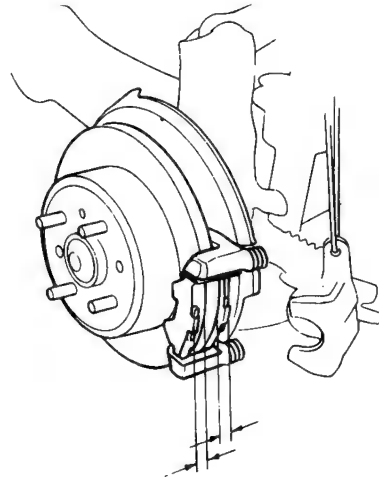
CAUTION:

- Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.
- Support the caliper with a piece of wire so that it does not hang from the brake hose.



If lining thickness is less than service limit at step 5, replace the rear pads as a set.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

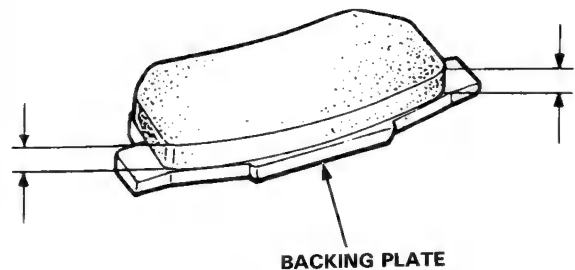


4. Remove the pad shims, pads and pad retainers.
5. Using vernier calipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:

Standard: 7.5 mm (0.30 in)

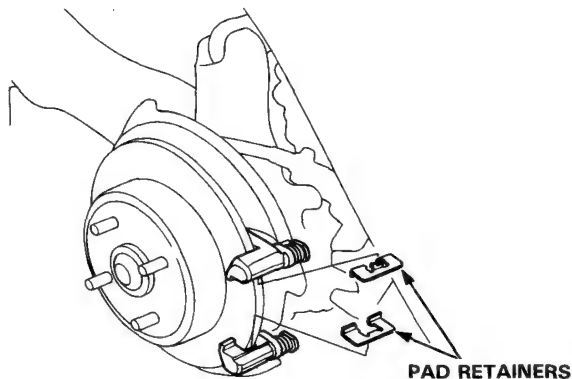
Service Limit: 1.6 mm (0.06 in)



NOTE: Measurement does not include pad backing plate thickness.



6. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
7. Make sure that the pad retainers are installed in the correct positions.



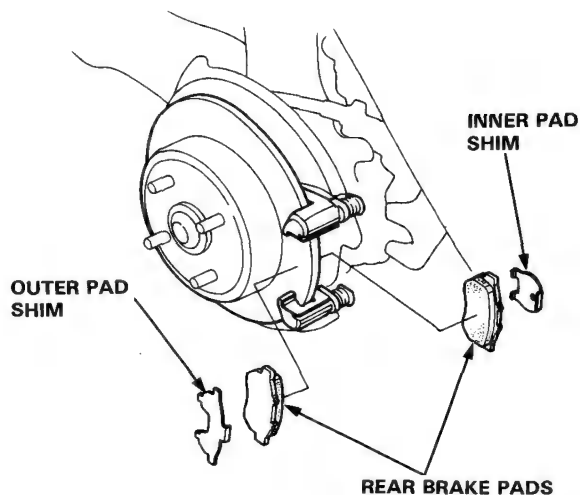
8. Install the brake pads and pad shims on caliper bracket.

⚠ WARNING

- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

NOTE:

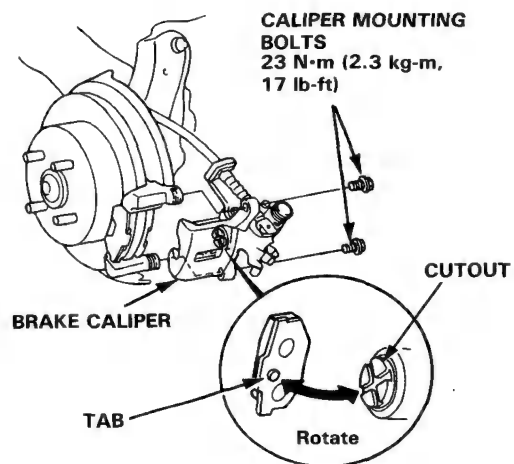
- Apply Molykote M77 to the pad side of the shims. Wipe excess grease off the shims.
- Install the inner pad with its wear indicator facing downward.



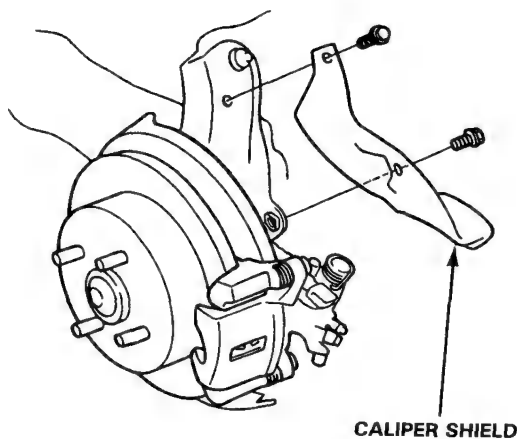
9. Rotate the caliper piston clockwise into place in the cylinder, then align the cutout in the piston with the tab on the inner pad by turning the piston back.

CAUTION: Lubricate the boot with silicone grease to avoid twisting the piston boot. If piston boot is twisted, back it out so it sits properly.

10. Install the brake caliper.
11. Install and tighten the caliper mounting bolts.



12. Install the caliper shield.



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

Rear Brake Disc

Runout Inspection

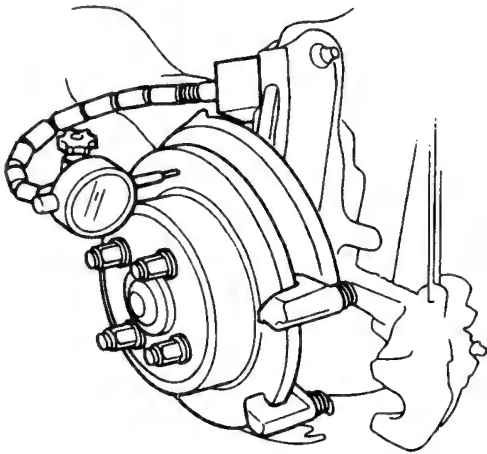
1. Loosen the rear wheel lug nuts slightly, then raise the car and support on safety stands. Remove the rear wheels.
2. Remove the brake pads (page 19-22).
3. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
4. Use lug nuts and suitable plain washers to hold the disc securely against the hub, then mount a dial indicator as shown and measure the runout at 10 mm (0.39 in) from the outer edge of the disc.

Brake Disc Runout:

Service Limit: 0.1 mm (0.004 in)

Max. Refinishing Limit: 8 mm (0.32 in)

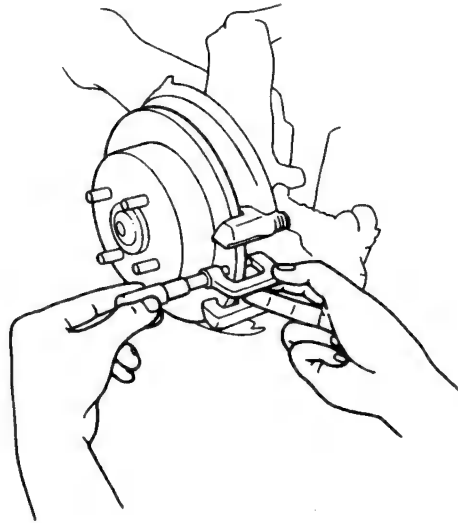
5. If the disc is beyond the service limit, refinish the rotor.



NOTE: A new disc should be refinished if its runout is greater than 0.1 mm (0.004 in).

Thickness and Parallelism Inspection

1. Loosen the rear wheel lug nuts slightly, then raise the car and support on safety stands. Remove the rear wheels.
2. Remove the brake pads (page 19-22).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.39 in) in from the outer edge of the disc.



Brake Disc Thickness:

Standard: 9 mm (0.35 in)

Max. Refinishing Limit: 8 mm (0.32 in)

Brake Disc Parallelism:

The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in).

4. If the disc is beyond the service limit, for thickness or parallelism, refinish the rotor.

Rear Caliper

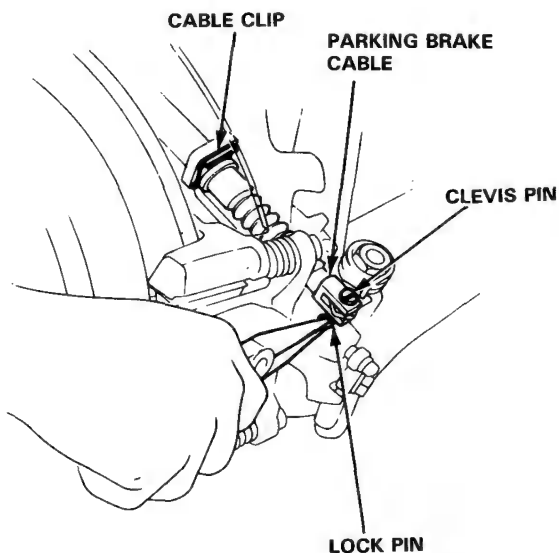


Disassembly

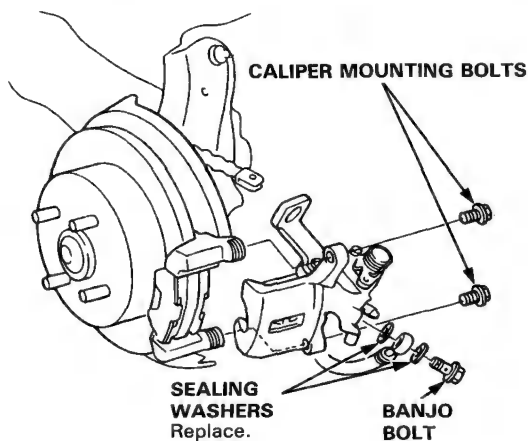
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

1. Remove the caliper shield (page 19-22).
2. Remove the lock pin and clevis pin. Remove the cable clip and disconnect the cable from the arm.

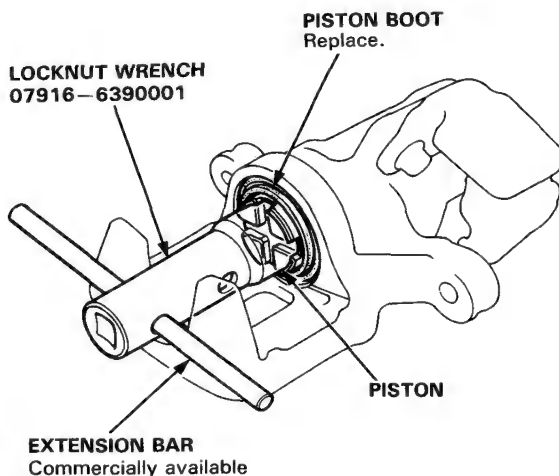


3. Remove the banjo bolt and two sealing washers.
4. Remove the two caliper mounting bolts and caliper body from the bracket.



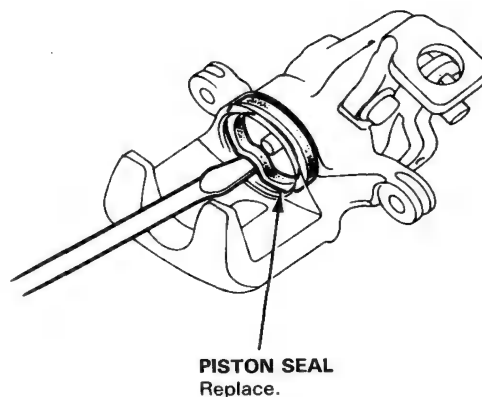
5. Remove the pad spring from the caliper body.
6. Remove the piston by rotating the piston counterclockwise with the special tool and remove the piston boot.

CAUTION: Avoid damaging the piston.



7. Remove the piston seal.

CAUTION: Take care not to damage the cylinder bore.



(cont'd)

Rear Caliper

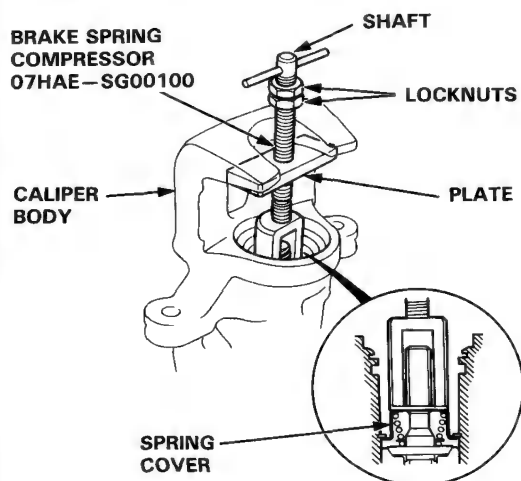
Disassembly (cont'd)

8. Install the special tool between the caliper body and spring cover.

CAUTION: Be careful not to damage the inside of the caliper cylinder during caliper disassembly.

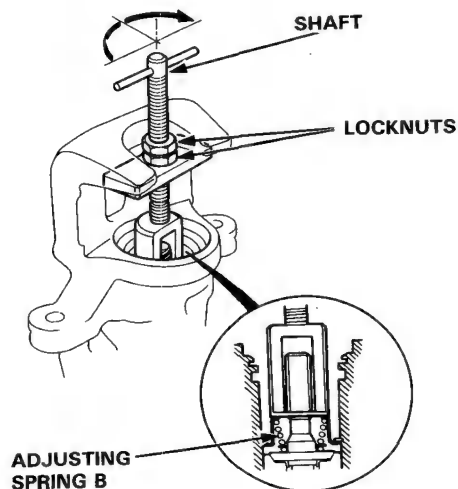
9. Position the locknuts as shown, then turn the shaft until the plate just contacts the caliper body.

NOTE: Do not compress the spring under the spring cover.



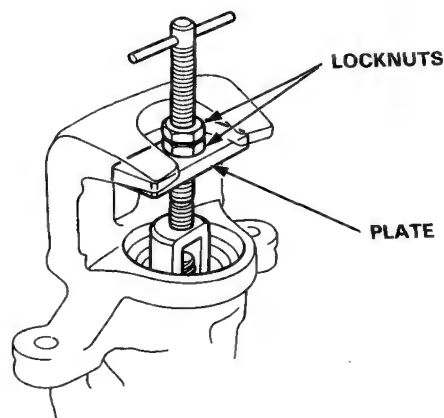
10. Turn the shaft clockwise $1/4$ – $1/2$ turn to compress the adjusting spring B in the caliper body.

CAUTION: To prevent damage to the inner components, do not turn the shaft more than $1/2$ turn.

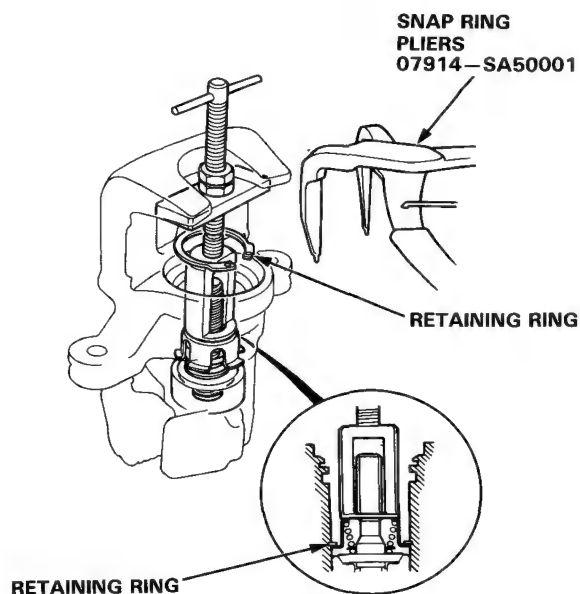


11. Lower the locknuts fully and tighten the locknuts securely.

NOTE: Keep the locknuts in this position until you reinstall the retaining ring.

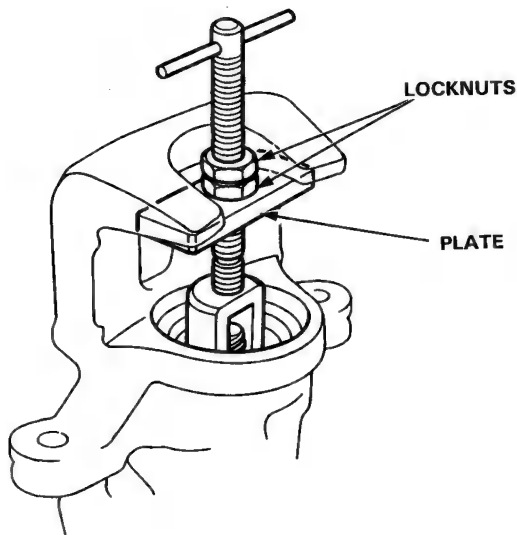


12. Remove the circlip with snap ring pliers.



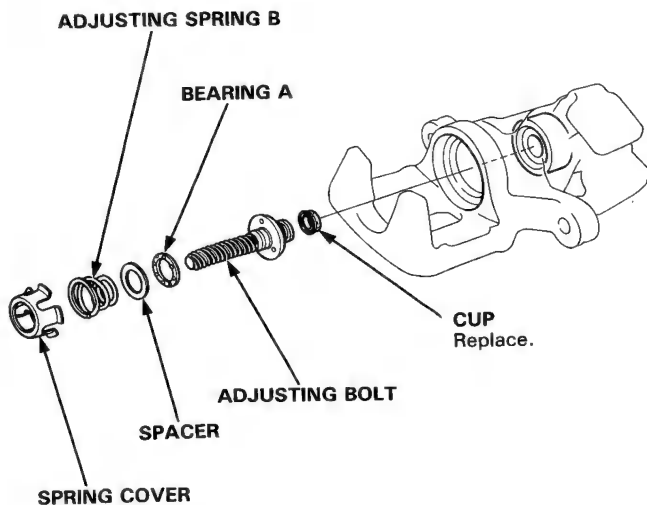


13. Hold the plate with your fingers and turn the shaft counterclockwise. Then, remove the special tool from the caliper.

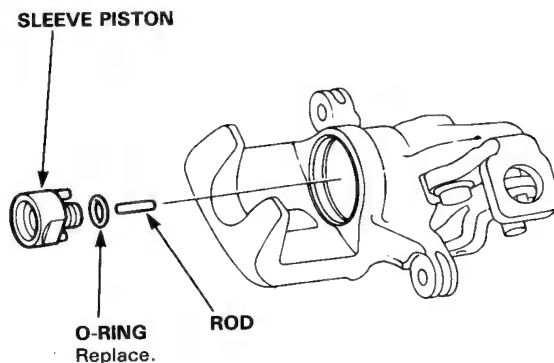


14. Remove the adjusting bolt.

15. Remove the spring cover, adjusting spring B, spacer, bearing A and cup from the adjusting bolt.



16. Remove the sleeve piston, and remove the pin from the cam.

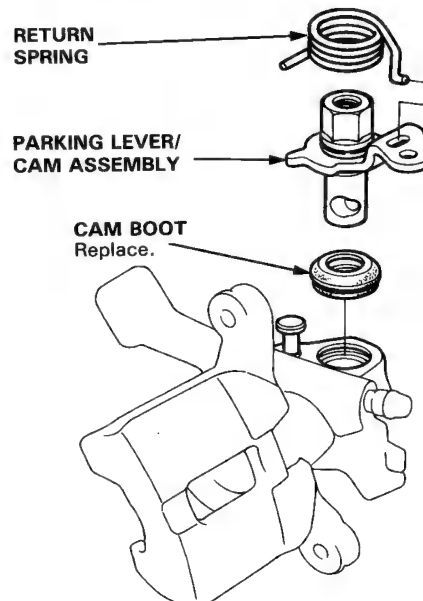


17. Remove the return spring.

18. Remove the parking lever and cam as an assembly from the caliper body.

CAUTION: Do not loosen the parking nut with the cam installed in the caliper body. If the lever and shaft must be separated, hold the lever in a vise and loosen the parking nut.

19. Remove the cam boot.



Rear Caliper Reassembly

CAUTION:

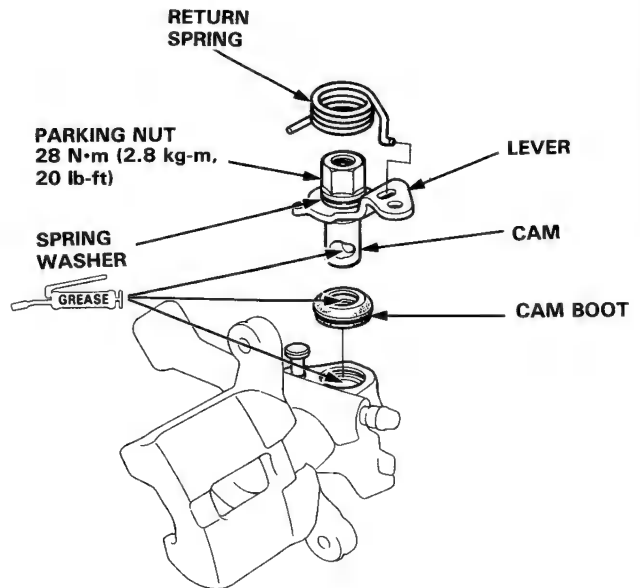
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

1. Pack all cavities of the needle bearing with commercially available assembly lube.
2. Coat the new cam boot with commercially available assembly lube and install it in the caliper body.
3. Apply commercially available assembly lube to the pin contacting area of the cam and install the cam and lever assembly into the caliper body.
4. Install the return spring.

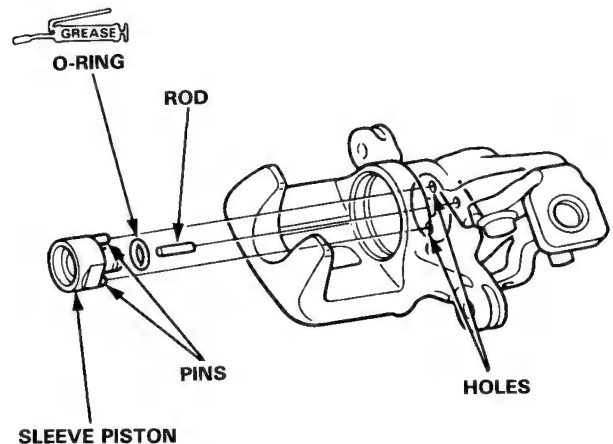
CAUTION:

- When the cam and lever were separated, be sure to assemble them before installing the cam in the caliper body. Install the lever and spring washer, apply locking agent to the threads, and tighten the parking nut while holding the lever with a vise.
- Avoid damaging the cam boot since it must be installed before the cam.
- When installing the cam, do not allow the cam boot lips to turn outside in.

 : Commercially available assembly lube

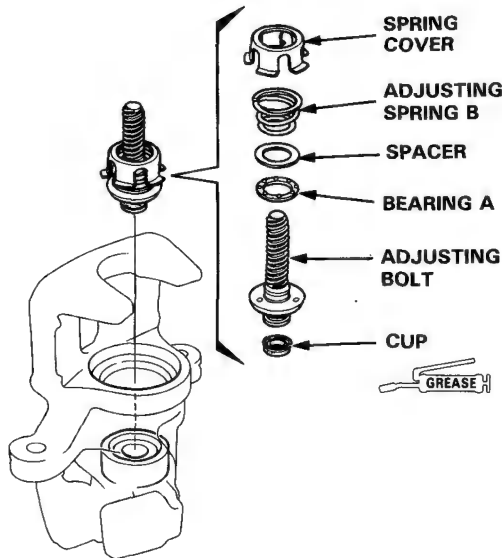


5. Install the pin in the cam.
6. Install a new O-ring on the sleeve piston.
7. Install the sleeve piston so the hole in the bottom of the piston is aligned with the pin in the cam, and two pins on the piston are aligned with the holes in the caliper.

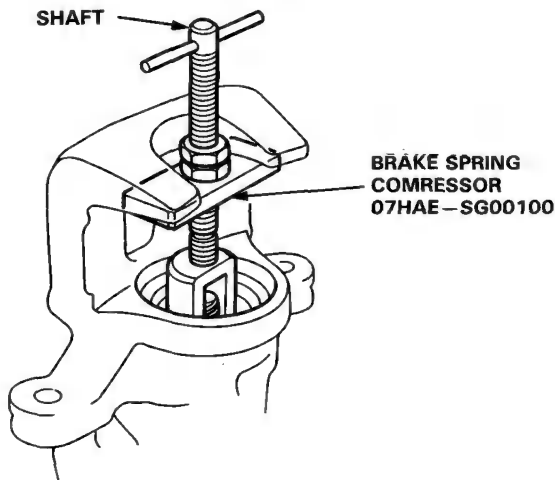




8. Coat a new cup with Brake Cylinder Grease (P/N: 08733-B020E) or equivalent rubber grease, and install it with its groove facing the bearing A side on the adjusting bolt.
9. Fit the bearing A, spacer, adjusting spring B and spring cover on the adjusting bolt, and install them in the caliper cylinder.

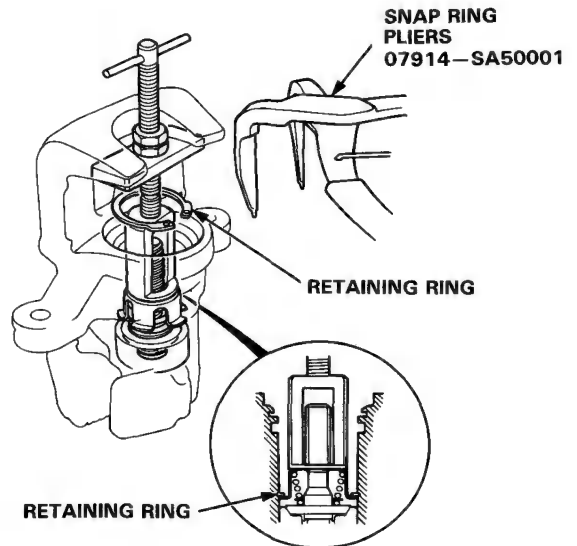


10. Install the special tool on the spring cover and turn the shaft until the locknut contacts the plate.

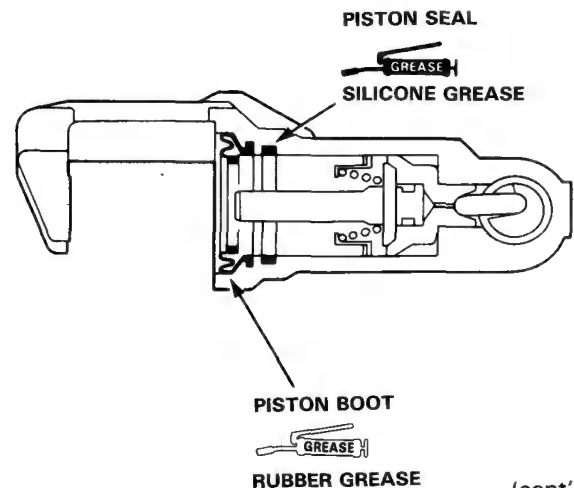


11. Check that the flared end of the spring cover is below the circlip groove.
12. Install the circlip in the groove, then remove the special tool.

NOTE: Check that the circlip is seated in the groove properly.



13. Coat a new piston seal with silicone grease and install it in the caliper.
14. Apply Brake Cylinder Grease (P/N: 08733-B020E) or equivalent rubber grease to the sealing lips and inside of a new piston boot, and install it in the caliper.



(cont'd)

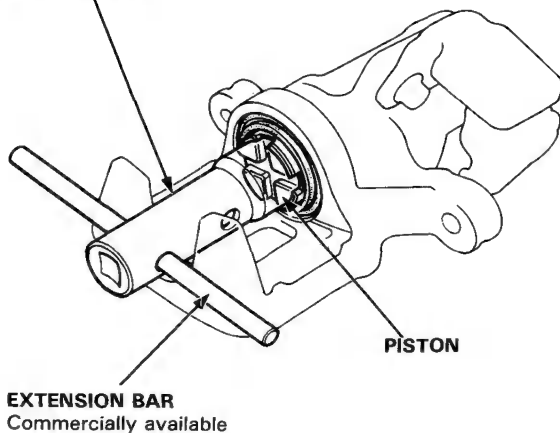
Rear Caliper

Reassembly (cont'd)

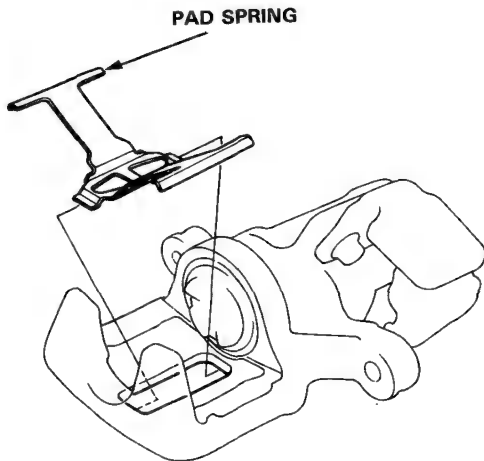
15. Coat the outside of the piston with brake fluid and install it on the adjusting bolt while rotating it clockwise with the special tool.

CAUTION: Avoid damaging the piston and piston boot.

LOCKNUT WRENCH
07916-6390001



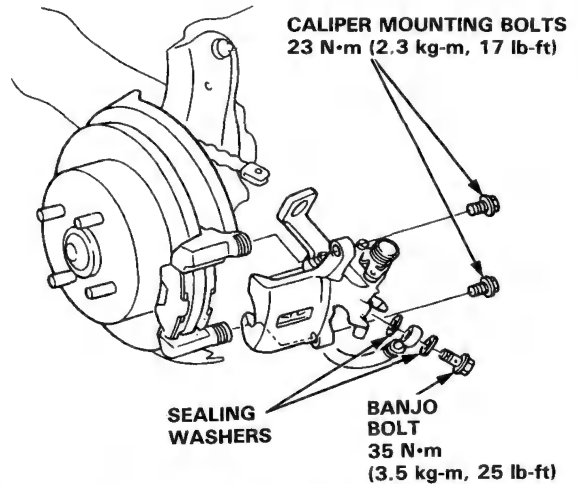
16. Install the pad spring on the caliper.



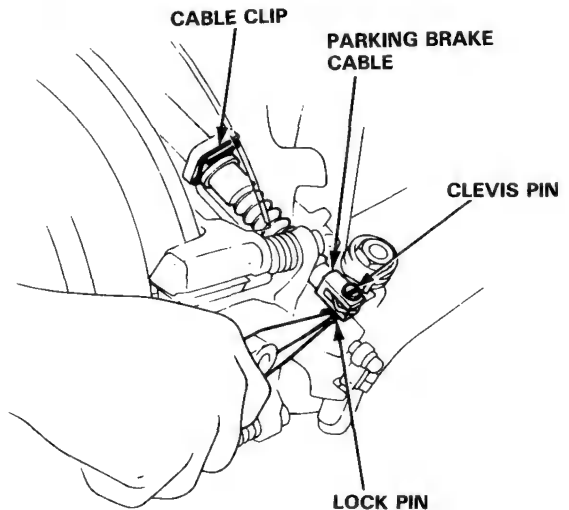
17. Install the brake pad retainers and brake pads.
18. Align the cutout in the piston with the tab on the inner pad (page 19-23).

19. Install the caliper on the caliper bracket and tighten the caliper mounting bolts.

20. Connect the brake hose to the caliper with new sealing washers and tighten the banjo bolt.



21. Insert the cable through the arm and connect the cable to the lever with the clevis pin and lock pin. Install the cable clip securely.



22. Install the caliper shield (page 19-23).

23. Fill the brake reservoir up and bleed the brake system (page 19-13).

24. Operate the brake pedal several times, then adjust the parking brake (page 19-5).

Rear Drum Brakes

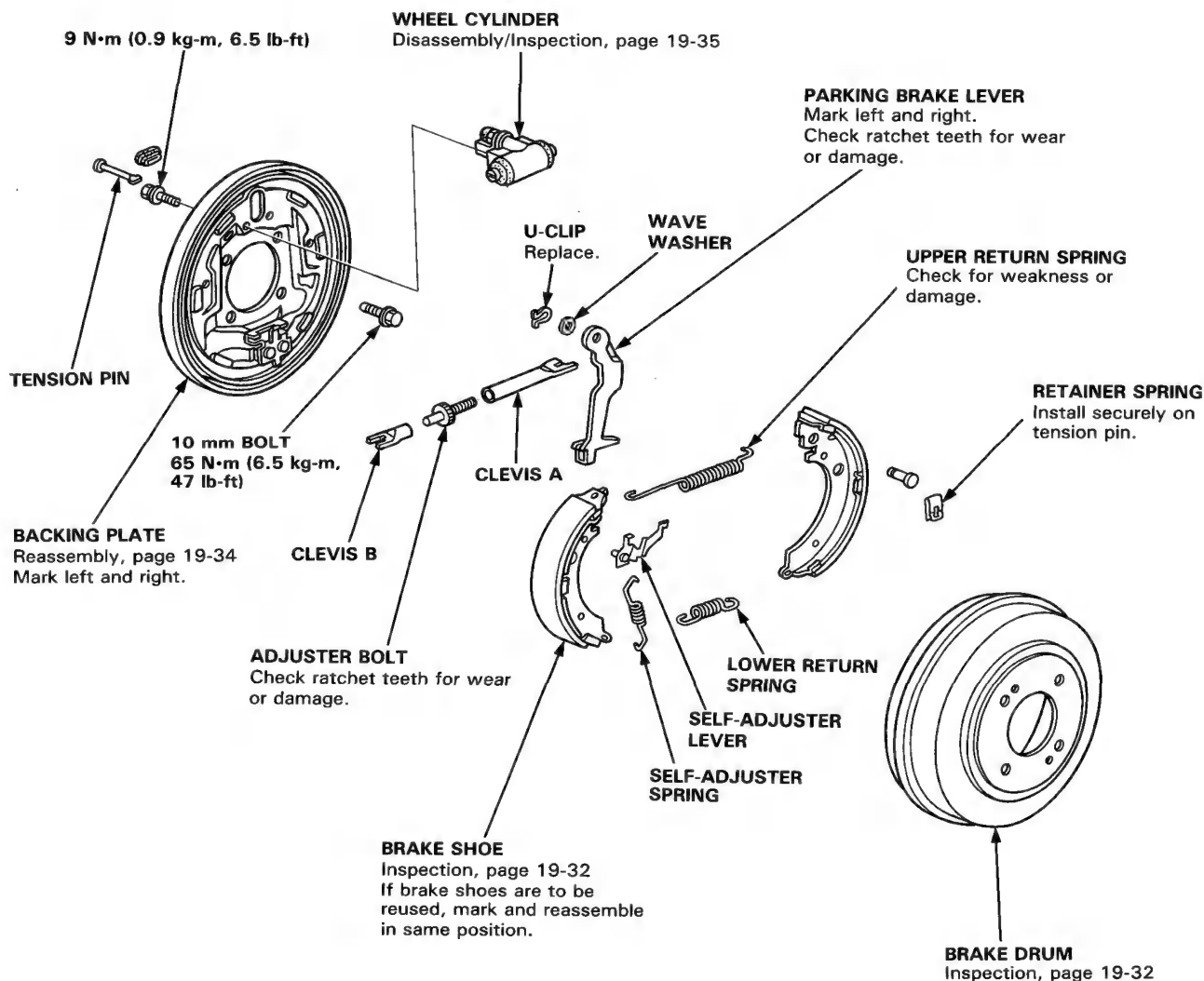


Index/Inspection

⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner to avoid breathing brake dust.
- Contaminated brake linings or drum reduce stopping ability.

1. Block the front wheels, loosen the rear wheel lug nuts slightly, support the rear of car on safety stands, then remove the rear wheels.
2. Loosen the parking brake and remove the rear brake drum.



Rear Drum Brake

Inspection

1. Check the wheel cylinder for leakage.
2. Check the brake linings for cracking, glazing, wear or contamination.
3. Measure the brake lining thickness.

Brake Lining Thickness:

2WD:

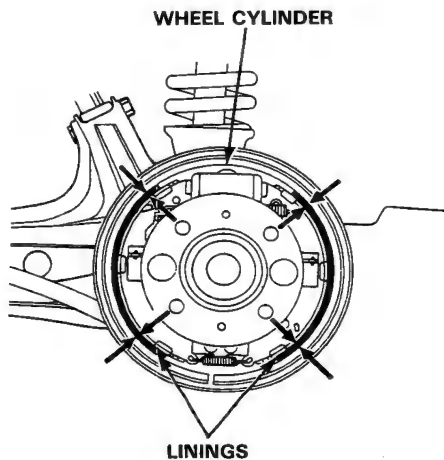
Standard: 4.5 mm (0.18 in)

Service Limit: 2.0 mm (0.08 in)

4WD:

Standard: 4.0 mm (0.16 in)

Service Limit: 2.0 mm (0.08 in)



NOTE: Measurement does not include brake shoe thickness.

4. Check the bearings in the hub unit for smooth operation. If defective, refer to section 18.

5. Measure the inside diameter of the brake drum.

Drum Inside Diameter:

2WD:

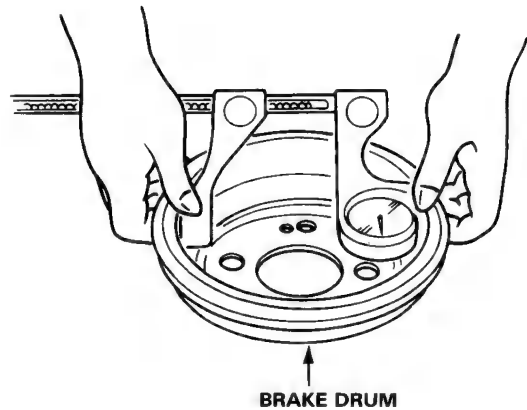
Standard: 180 mm (7.09 in)

Service Limit: 181 mm (7.13 in)

4WD:

Standard: 200 mm (7.87 in)

Service Limit: 201 mm (7.91 in)



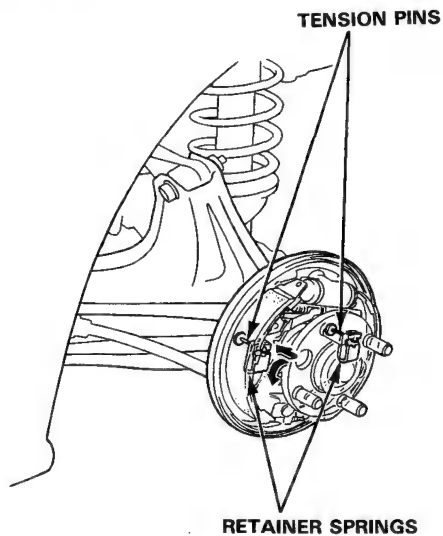
6. Check the brake drum for scoring, grooving and cracks.

Rear Brake Shoes



Disassembly

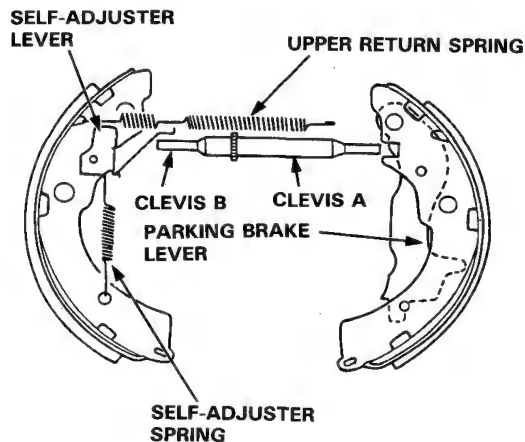
1. Remove the tension pins by pushing the retainer springs and turning them.



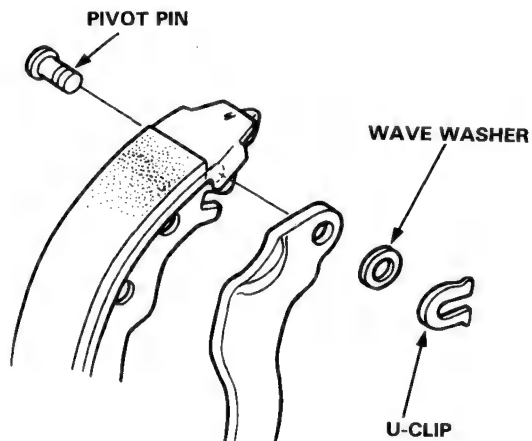
2. Lower the brake shoe assembly and remove the lower return spring.

NOTE: Be careful not to damage the dust cover on the wheel cylinder.

3. Remove the brake shoe assembly.
4. Disconnect the parking brake cable from the parking brake lever.
5. Remove the upper return spring, self-adjuster lever and self-adjuster spring, and separate the brake shoes.



6. Remove the wave washer, parking brake lever and pivot pin from the brake shoe by removing the U-clip.



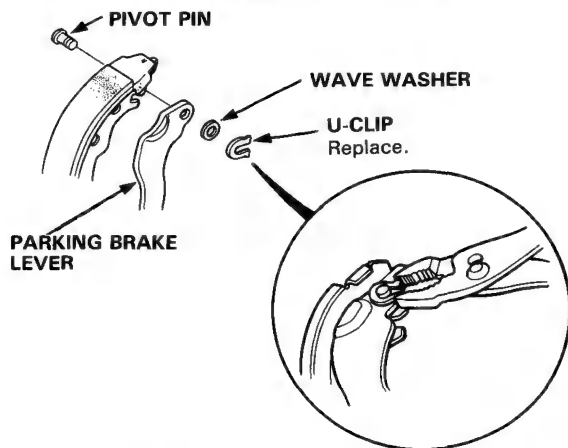
Rear Brake Shoes

Reassembly

1. Apply Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease to the sliding surface of the pivot pin, and insert the pin into the brake shoe.

2. Install the parking brake lever and wave washer on the pivot pin and secure with U-clip.

NOTE: Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.

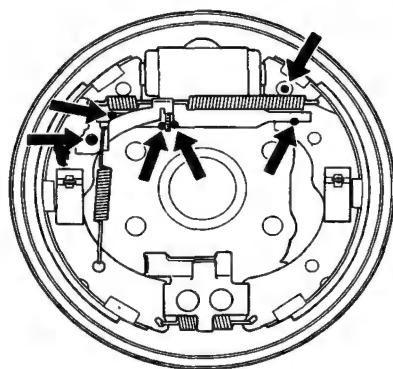


3. Connect the parking brake cable to the parking brake lever.
4. Apply grease on each sliding surface.

CAUTION: Contaminated brake linings reduce stopping ability. Keep grease or oil off the brake linings. Wipe any excess grease off the parts.

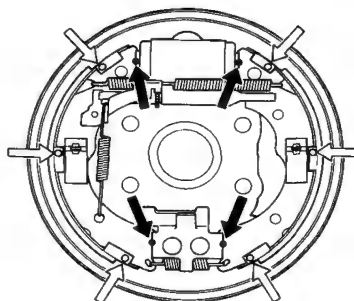
- Apply Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease to the sliding surfaces as shown.

→ ● Sliding surface



- Apply Molykote 44MA to the brake shoe ends and opposite edges of the shoes as shown.

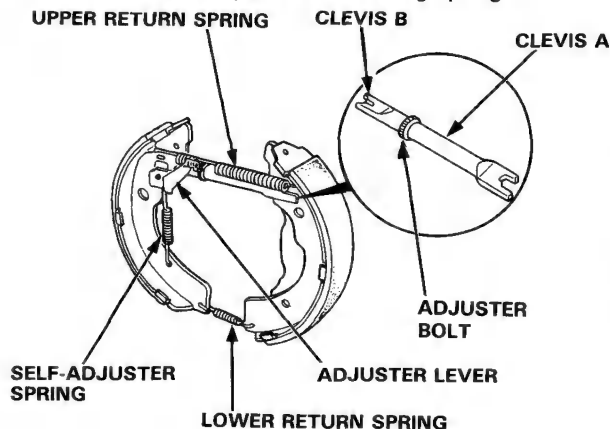
→ ● Brake shoe ends
→ ○ Opposite edge of the shoe



5. Clean the threaded portions of clevises A and B. Coat the threads of the clevises with grease. To shorten the clevises, turn the adjuster bolt.
6. Hook the adjuster spring to the adjuster lever first, then to the brake shoe.
7. Install the clevises and upper return spring noting the installation direction.

NOTE: Be careful not to damage the wheel cylinder dust covers.

8. Install the lower return spring.
9. Install the tension pins and retaining springs.



10. Install the brake drum.
11. If the wheel cylinder has been removed, bleed the brake system (page 19-13).
12. Depress the brake pedal several times to set the self-adjusting brake.
13. Adjust the parking brake (page 19-5).

Wheel Cylinder



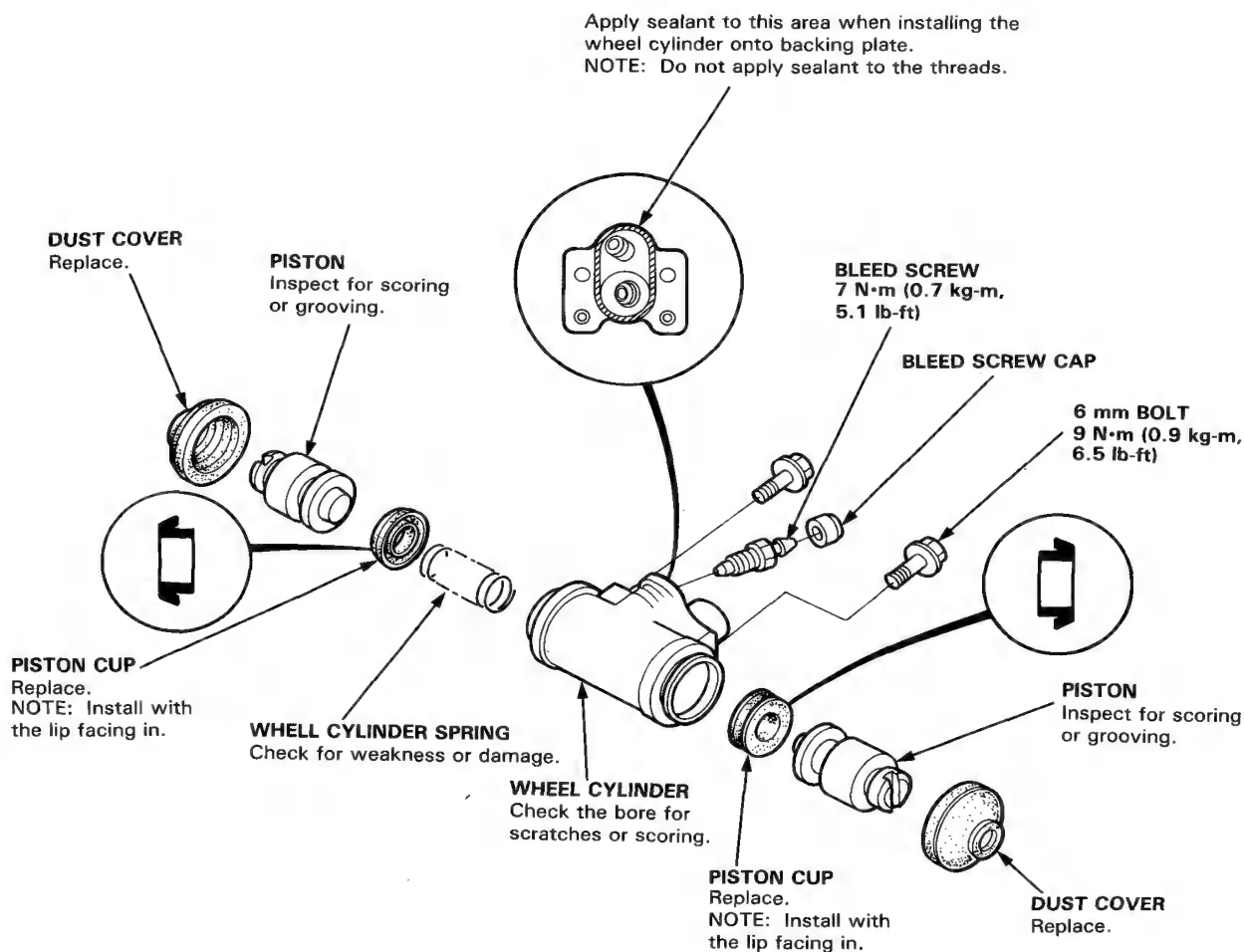
Disassembly/Inspection

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE:

- Coat piston, piston cup, and wheel cylinder bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

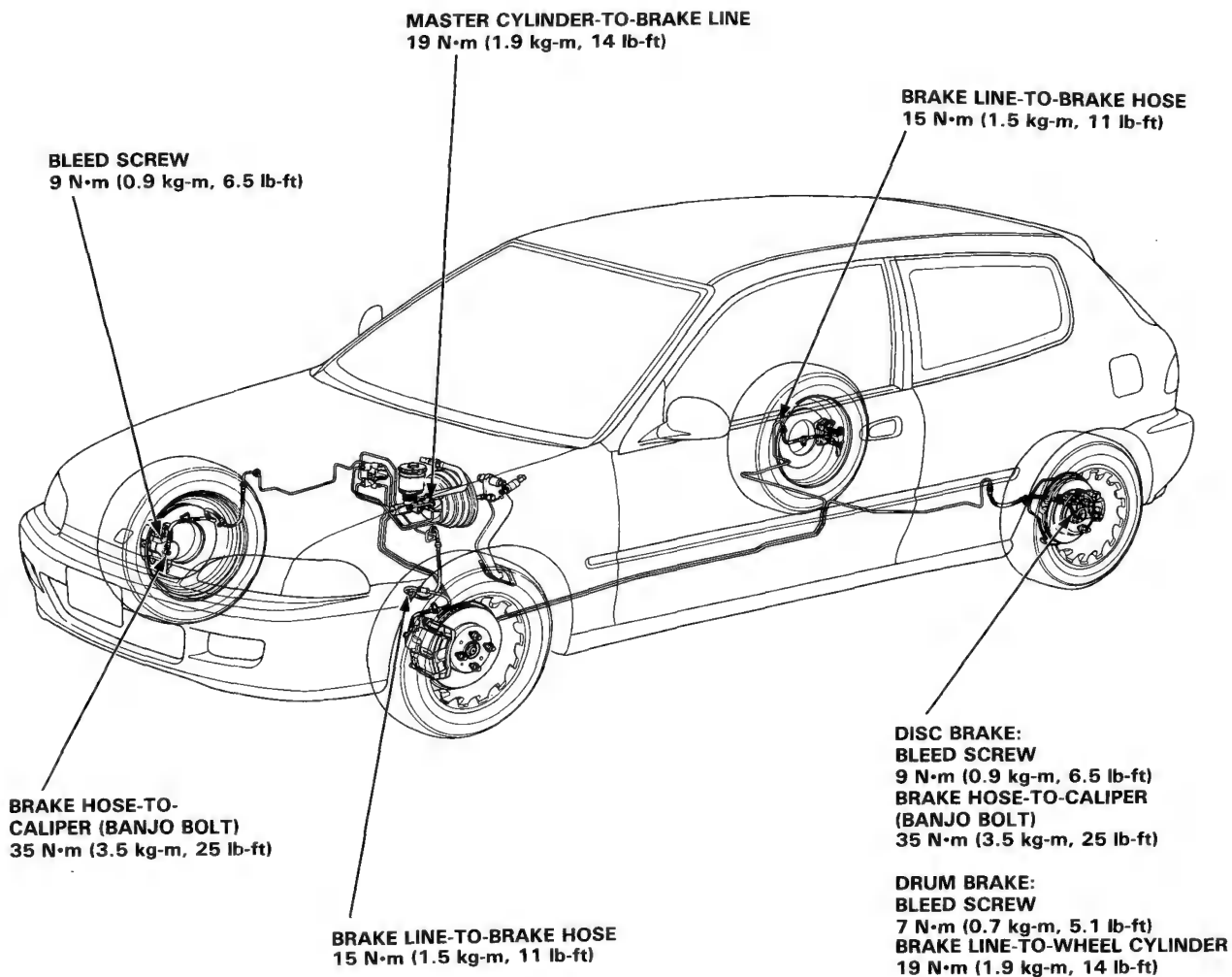


Brake Hoses/Pipes

Inspection

1. Inspect the brake hoses for damage, leaks, interference or twisting.
2. Check the brake lines for damage, rusting or leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.

CAUTION: Replace the brake hose clip whenever the brake hose is serviced.



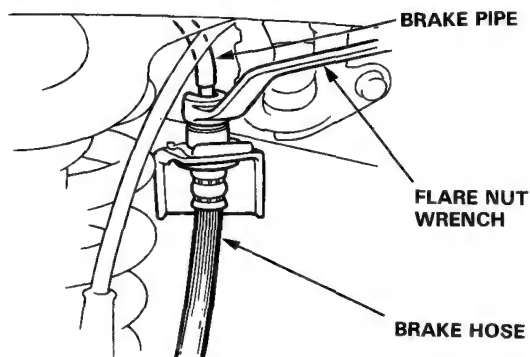


Brake Hose Replacement

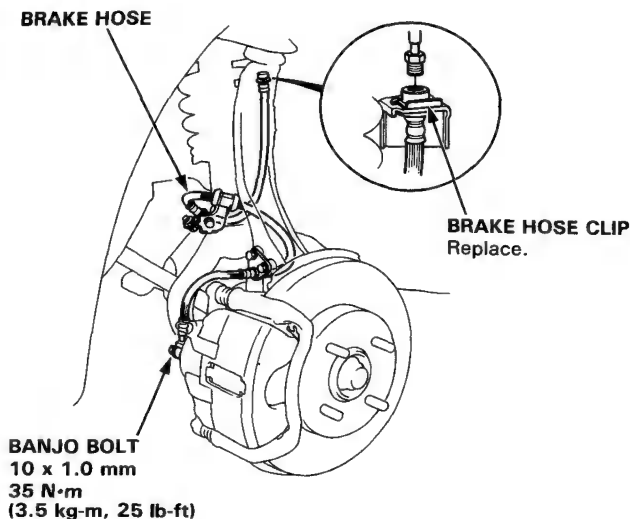
CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Use only clean DOT 3 or DOT 4 brake fluid.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

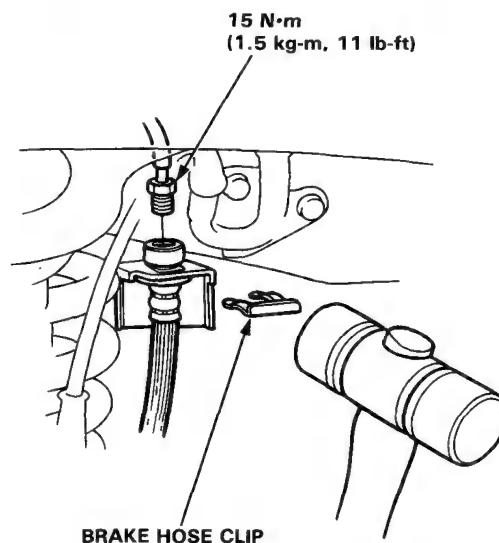
1. Replace the brake hose if the hose is twisted, cracked or if it leaks.
2. Disconnect the brake hose from the brake pipe using a 10 mm flare nut wrench.



3. Remove and discard the brake hose clip from the brake hose.
4. Remove the banjo bolt and disconnect the brake hose from the caliper.



5. Install a new brake hose clip on the brake hose.
6. Connect the brake pipe to the brake hose.

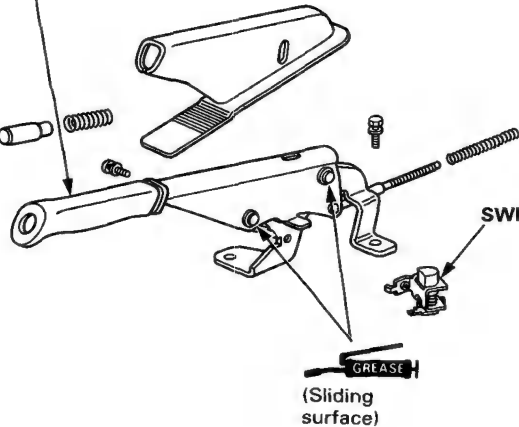


7. Connect the brake hose to the caliper.
8. Install the brake hose on the knuckle and damper mounting clamp.
9. After installing the brake hose, check the hose and line joints for leaks, and tighten if necessary.

Parking Brake

Disassembly and Reassembly

PARKING BRAKE LEVER
Check for smooth operation.



DRUM BRAKE

SWITCH

CLIP

CLEVIS PIN

LOCK PIN
Replace.

Check for faulty movement.

ADJUSTING NUT

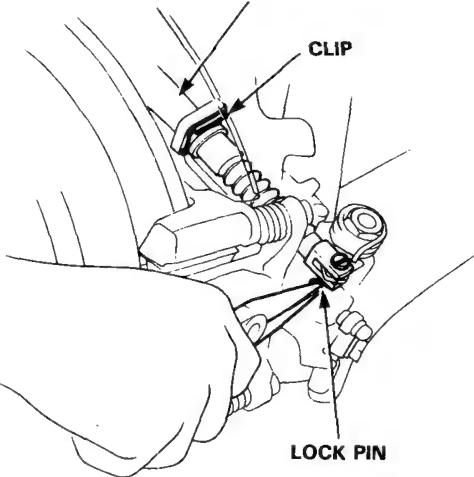
EQUALIZER

BRACKET

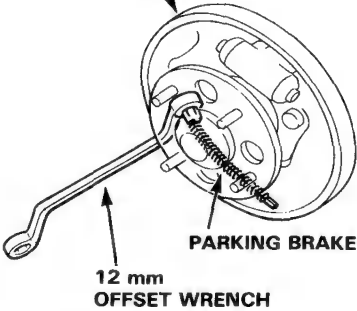
Disconnect the parking brake cable from the lever on the caliper by removing the lock pin.

Remove the parking brake cable from the backing plate using a 12 mm offset wrench as shown.

PARKING BRAKE CABLE



BACKING PLATE



Anti-Lock Brake System

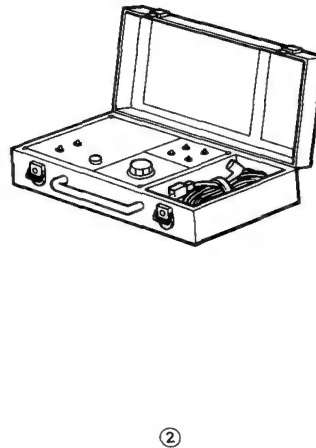
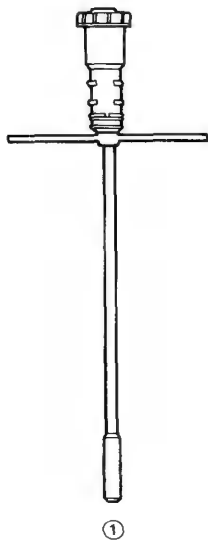
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Illustrated Index	19-41	Removal/Installation	19-110
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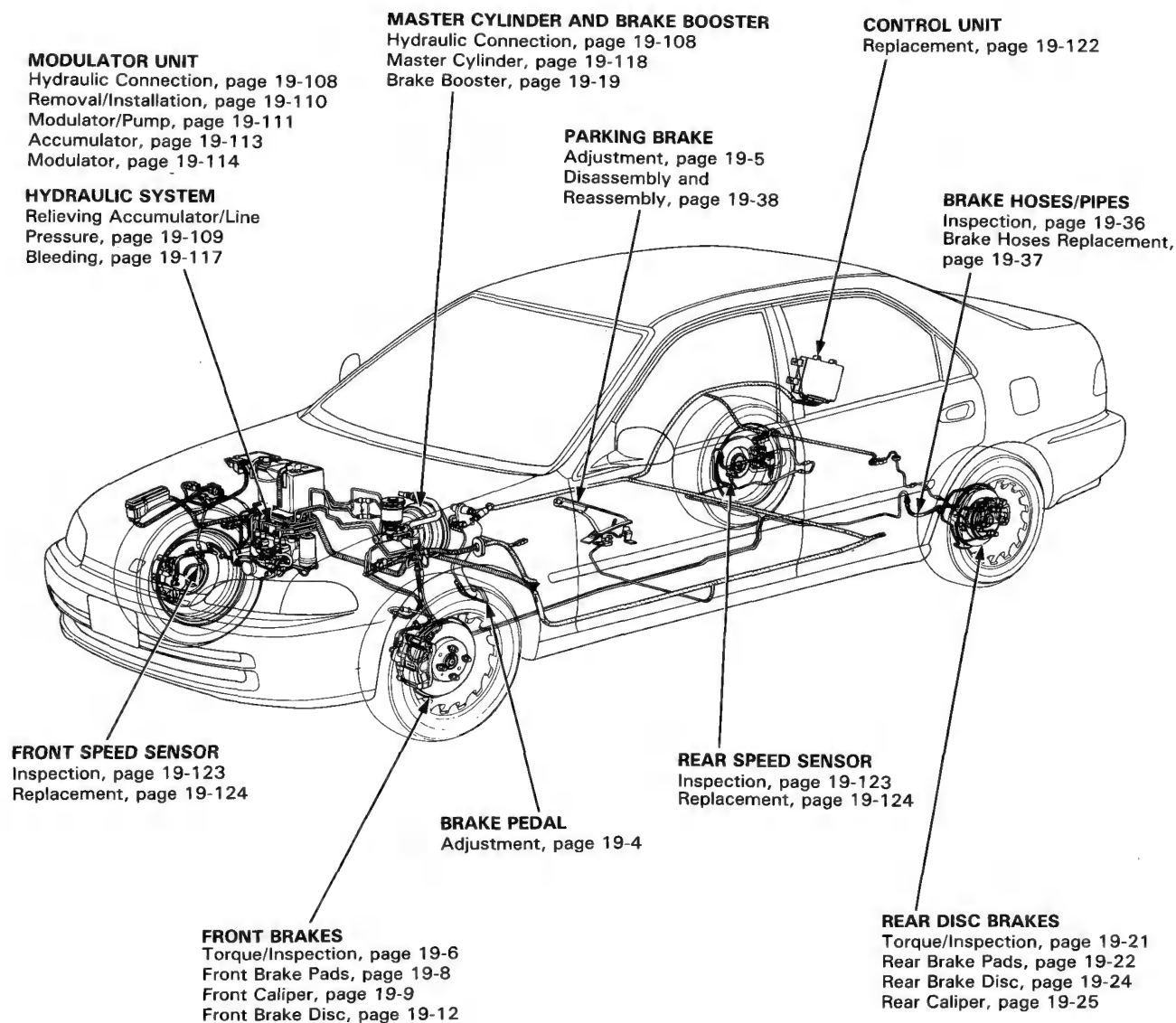
ABS

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Page Reference
①	07HAA—SG00100 or 07HAA—SG00101	Bleeder-T Wrench	1	19-71, 19-78, 19-109, 19-117
②	07HAJ—SG00602 or 07HAJ—SG00601 or 07508—SB000000 and 07HAJ—SG00400	ALB Checker Adaptor	1 1	19-61, 19-63, 19-64, 19-117



⚠ WARNING The accumulator contains high-pressure nitrogen gas, do not puncture, expose to flame or attempt to disassemble the accumulator or it may explode; severe personal injury may result.



Anti-lock Brake System

Features/Construction/Operation

In a conventional brake system, if the brake pedal is depressed very hard, the wheels can lock before the vehicle comes to a stop. In such a case, the stability of the vehicle is reduced if the rear wheels are locked, and maneuverability of the vehicle is reduced if the front wheels are locked, creating an extremely unstable condition.

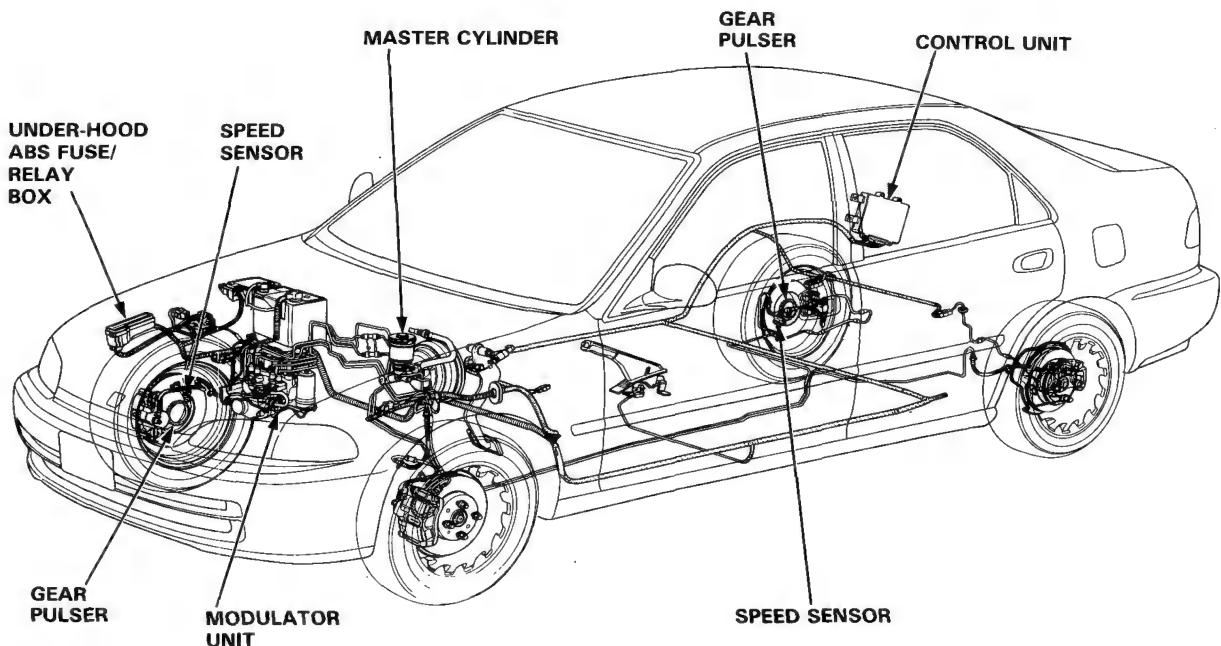
The Anti-Lock Brake System (ABS) modulates the pressure of the brake fluid applied to each front caliper or both rear calipers thereby preventing the locking of the wheels, whenever the wheels are likely to be locked due to hard braking. It then restores normal hydraulic pressure when there is no longer any possibility of wheel locking.

Features

- Increased braking stability can be achieved regardless of changing driving conditions.
- The maneuverability of the vehicle is improved as the system prevents the front wheels from locking.
- When the anti-lock brake system goes into action, a kickback is felt on the brake pedal.
- The system is equipped with a self-diagnosis function. When an abnormality is detected, the anti-lock brake system indicator light comes on. The location of the system's trouble can be diagnosed from the frequency of the system indicator light blinks.
- This system has individual control of the front wheels and common control ("Select Low") for the rear wheels. "Select Low" means that the rear wheel that would lock first (the one with the lowest resistance to lock-up) determines anti-lock brake system activation for both rear wheels.
- The system has a fail-safe function that allows normal braking if there's a problem with the anti-lock brake system.

Construction

In addition to the conventional braking system, the anti-lock brake system is composed of: gear pulsers attached to the rotating part of individual wheels; speed sensors, which generate pulse signals corresponding to the revolution of the gear pulsers; control unit, which controls the working of the anti-lock brake system by performing calculations based on the signals from the individual speed sensors and the individual switches; modulator unit, which adjusts the hydraulic pressure applied to each caliper on the basis of the signals received from the control unit; an accumulator, in which high-pressure brake fluid is stored, a pressure switch, which detects the pressure in the accumulator and transmits signals to the control unit; a power unit, which supplies the high-pressure working fluid to the accumulator by means of a pump; a motor relay for driving the power unit; a fail-safe relay, which cuts off the solenoid valve ground circuit when the fail-safe device is at work; and, an indicator light.



Master Cylinder

1. Construction

A tandem master cylinder is used to improve the safety of the braking system. In addition, center valves are used so as to match the anti-lock brake system operation.

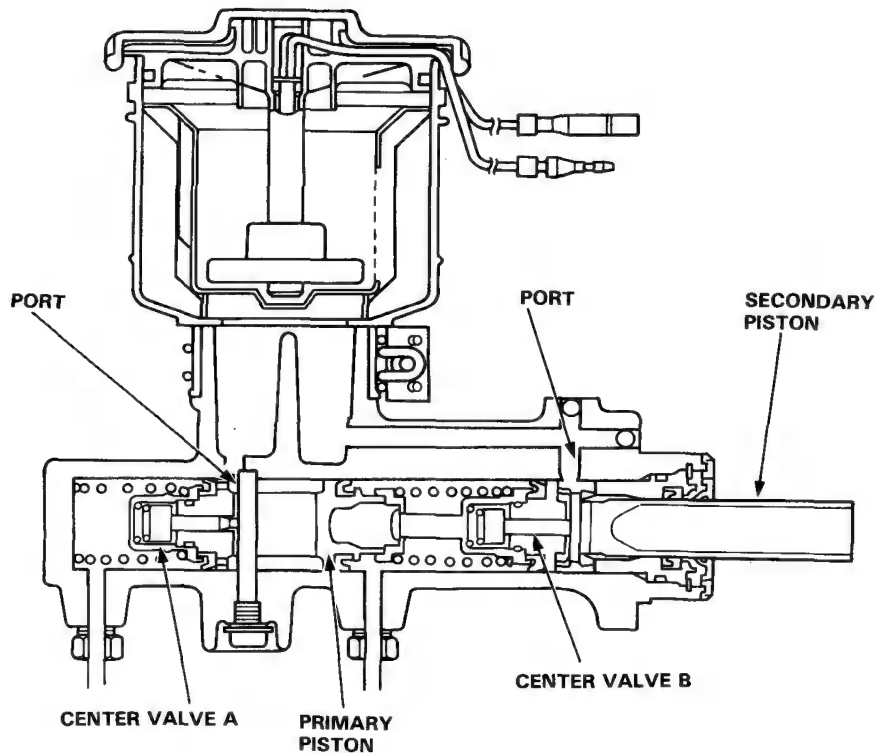
The master cylinder has one reservoir tank which is connected to the cylinder sections by two small holes. It has two pistons: primary and secondary, which are criss-cross connected with the calipers so that the fluid pressure works separately on each system (front right wheel & rear left wheel, and front left wheel & rear right wheel).

A stop bolt for controlling movement of the primary piston is provided at the side of the master cylinder body. A reed switch for detecting the brake fluid volume is also provided in the cap of the reservoir tank.

2. Operation

When the brake pedal is depressed, the secondary piston is pushed through the brake booster and the center valve B is closed so that fluid pressure is generated on the secondary side. At the same time, the primary piston is pushed by the secondary fluid pressure and the center valve A is closed so that braking fluid pressure is generated both on the primary and secondary sides.

When the brake pedal is released, the primary and secondary pistons are returned to the original position by the brake fluid pressure and piston spring.



(cont'd)

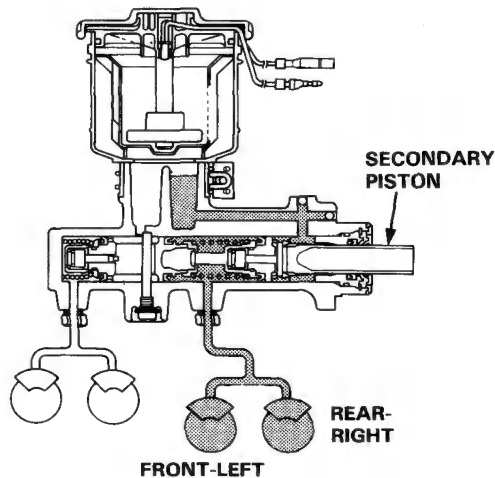
Anti-lock Brake System

Features/Construction/Operation (cont'd)

3. Responses when fluid is leaking

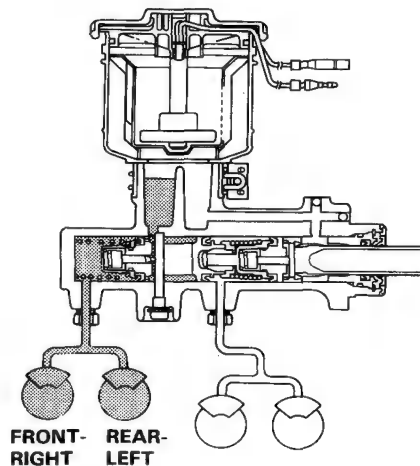
(1) In case of leaking from the primary system:

Since the fluid pressure on the primary side does not rise, the primary piston is pushed by the fluid pressure of the secondary piston and the tension of the piston spring until the end hits on the cylinder, the braking is performed by the fluid pressure on the secondary side.



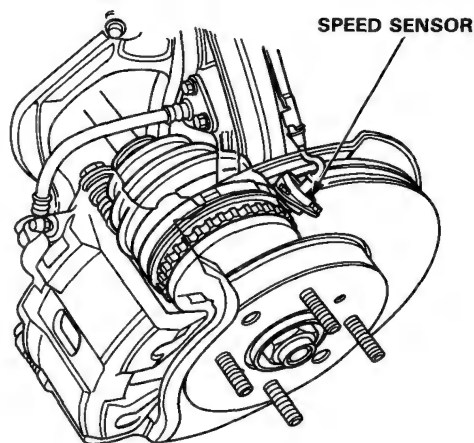
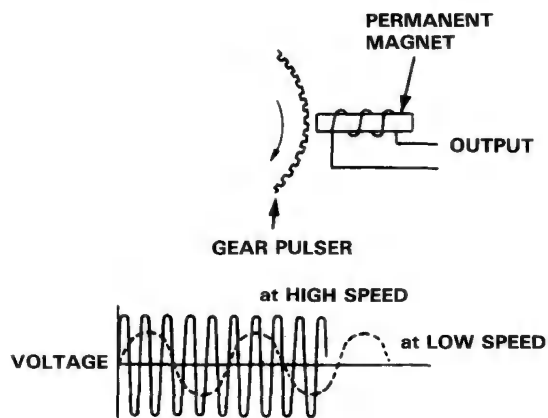
(2) In case of leaking from the secondary system:

The secondary piston does not produce fluid pressure, keeps moving ahead, hits on the end surface of the primary piston so that the primary piston is pushed under the same condition as an ordinary rod. Therefore, the braking is conducted by the fluid pressure on the primary side.



Speed Sensor

The speed sensor is a contactless type that detects the rotating speed of a wheel. It is comprised of a permanent magnet and coil. When the gear pulsers attached to the rotating parts of each wheel (front wheel: outboard joint of the driveshaft, rear: hub bearing unit) turn, the magnetic flux around the coil in the speed sensor alternates, generating voltages with frequency in proportion to wheel rotating speed. These pulses are sent to the control unit and the control unit identifies the wheel speeds.



Control Unit

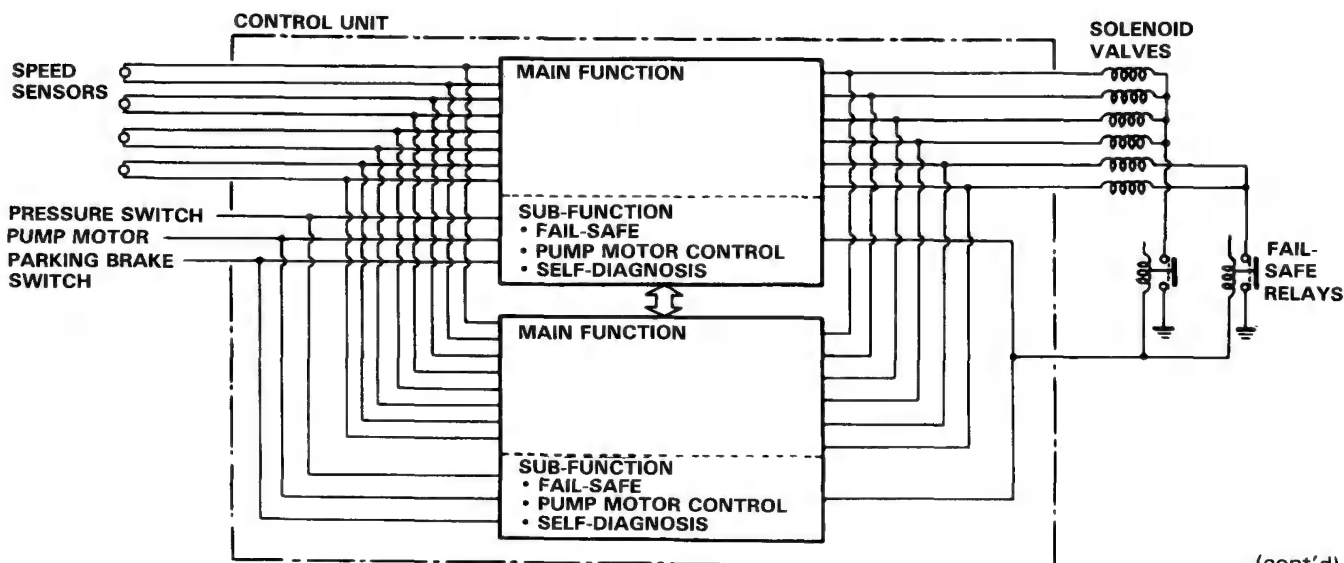
The control unit consists of a main function section, which controls the operation of the anti-lock brake system, and sub-function, which controls the pump motor and "self-diagnosis".

1. Main Function

The main function section of the control unit performs calculations on the basis of the signals from each speed sensor and controls the operation of the anti-lock brake system by putting into action the solenoid valves in the modulator unit for each front brake and for the two rear brakes.

2. Sub-Function

The sub-function section gives driving signals to the pump motor and also gives "self-diagnosis" signals, necessary for backing up the anti-lock brake system.



(cont'd)

Anti-lock Brake System

Features/Construction/Operation (cont'd)

1. Self-Diagnostic Function

Since the anti-lock brake system modulates the braking pressure when a wheel is about to lock, regardless of the driver's intention, the system operation and the braking power will be impaired if there is a malfunction in the system. To prevent this possibility, at speeds above 6 km/h, the self-diagnosis function, provided in the sub-function of the control unit, monitors the main system functions. When an abnormality is detected, the anti-lock brake system indicator light goes on. There is also a check mode of the self-diagnosis system itself; when the ignition switch is first turned on, the anti-lock brake system indicator light comes on and stays on for a few seconds after the engine starts, to signify that the self-diagnosis system is functional.

2. Fail-Safe Function

When abnormality is detected in the control system by the self-diagnosis, the solenoid operations are suspended by turning off the relay (fail-safe relay) which disconnects the ground lines of all the solenoid valves to inhibit anti-lock brake system operations. Under these conditions, the braking system functions just as an ordinary one, maintaining the necessary braking function. When the anti-lock brake system indicator light is turned on, it means the fail-safe is functioning.

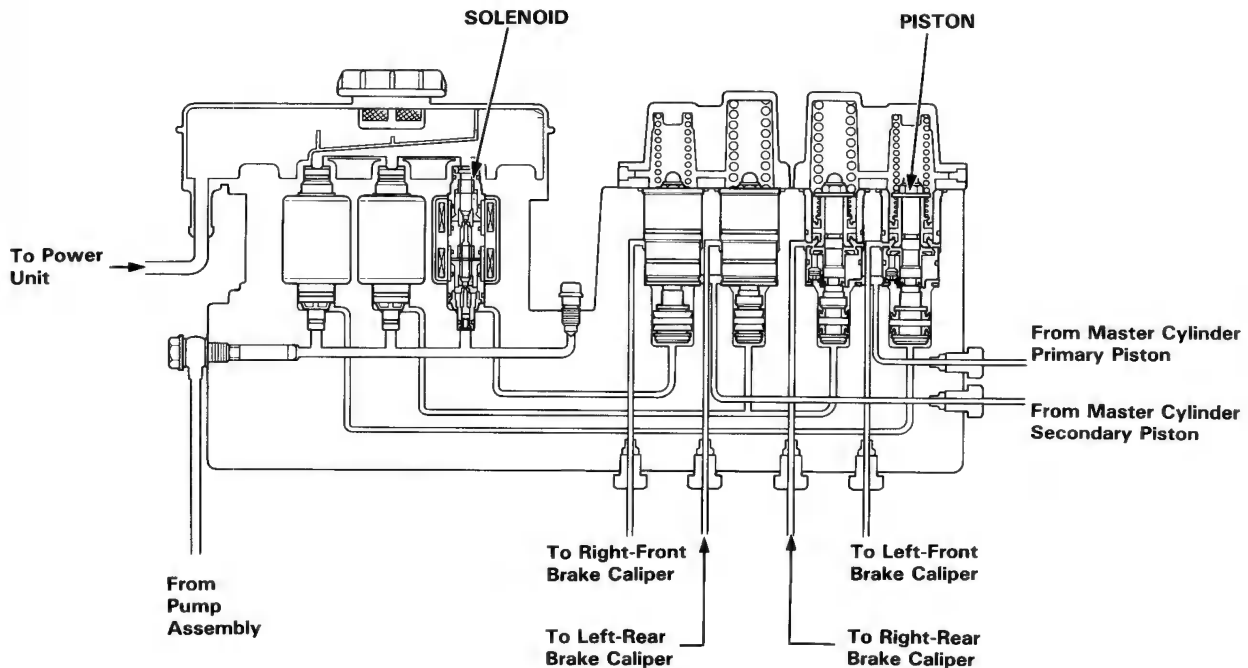
Modulator Unit

Modulators for each wheel and solenoid valves are integrated in the modulator unit.

The modulators for front and rear brakes are of independent construction and are positioned vertically for improved maintainability. The modulators for rear brakes are provided with a PCV function (Proportioning Control Valve) in order to prevent the rear wheel from locking when the anti-lock brake system is malfunctioning or the anti-lock brake system is not activated.

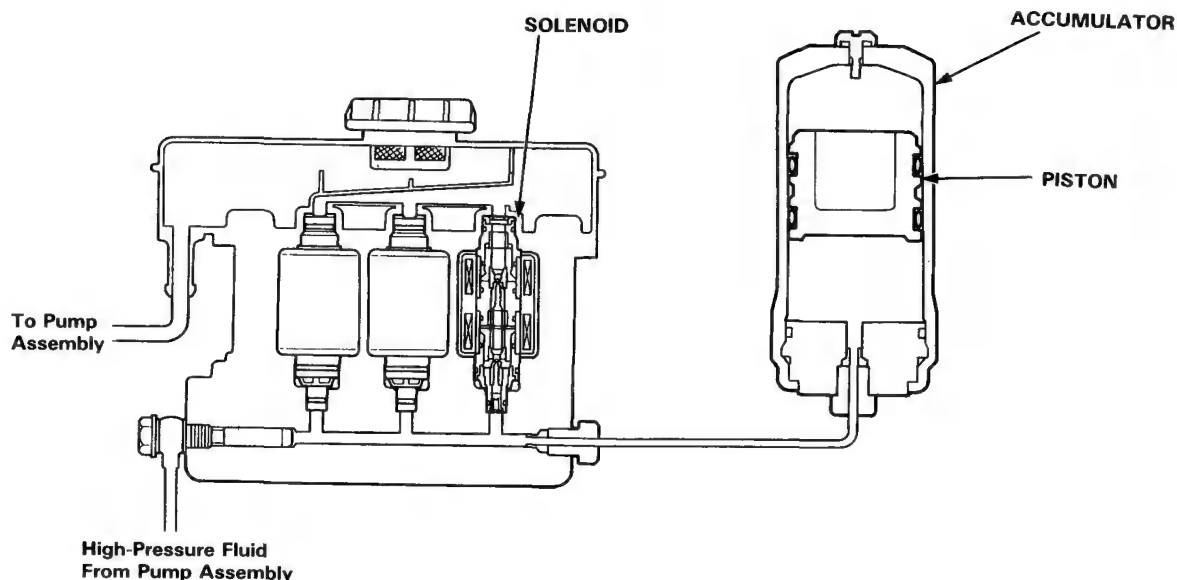
The solenoid valve features quick response (5 ms or less).

The inlet and outlet valves are integrated in the solenoid valve unit. There are three solenoid valves provided, one each for the front-right wheel, for the front-left wheel and for the rear wheels.



Accumulator

The accumulator is a pneumatic type which accumulates high-pressure brake fluid fed from the pump incorporated in the power unit. When the anti-lock brake system operates, the accumulator and the power unit supply high-pressure brake fluid to the modulator valve via the inlet side of the solenoid valve.

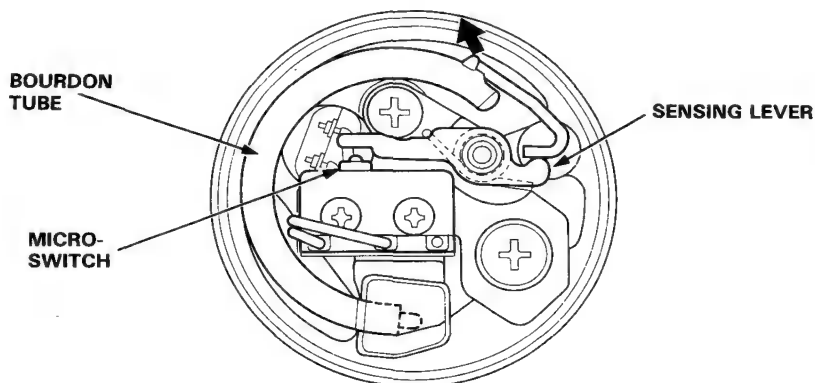


Pressure Switch

The pressure switch monitors the pressure accumulation (pressure from the pump) in the accumulator and is turned off when the pressure becomes lower than a prescribed level. When the pressure switch is turned off, the switching signal is sent to the control unit. Upon receiving the signal, the control unit activates the pump motor relay to operate the motor. If the pressure doesn't reach the prescribed value, the anti-lock brake system indicator light comes on.

Operation

When the pressure in the accumulator rises, the Bourdon tube in the pressure switch deforms outwards. When the free end of the Bourdon tube moves more than the prescribed amount, the micro-switch is activated by the force of the spring attached to the sensing lever. When the pressure in the accumulator decreases due to anti-lock brake system operations, the Bourdon tube moves in the direction opposite to the one described above, and the micro-switch is eventually turned off. Upon receiving this signal, the control unit activates the motor relay to operate the motor.



(cont'd)

Anti-lock Brake System

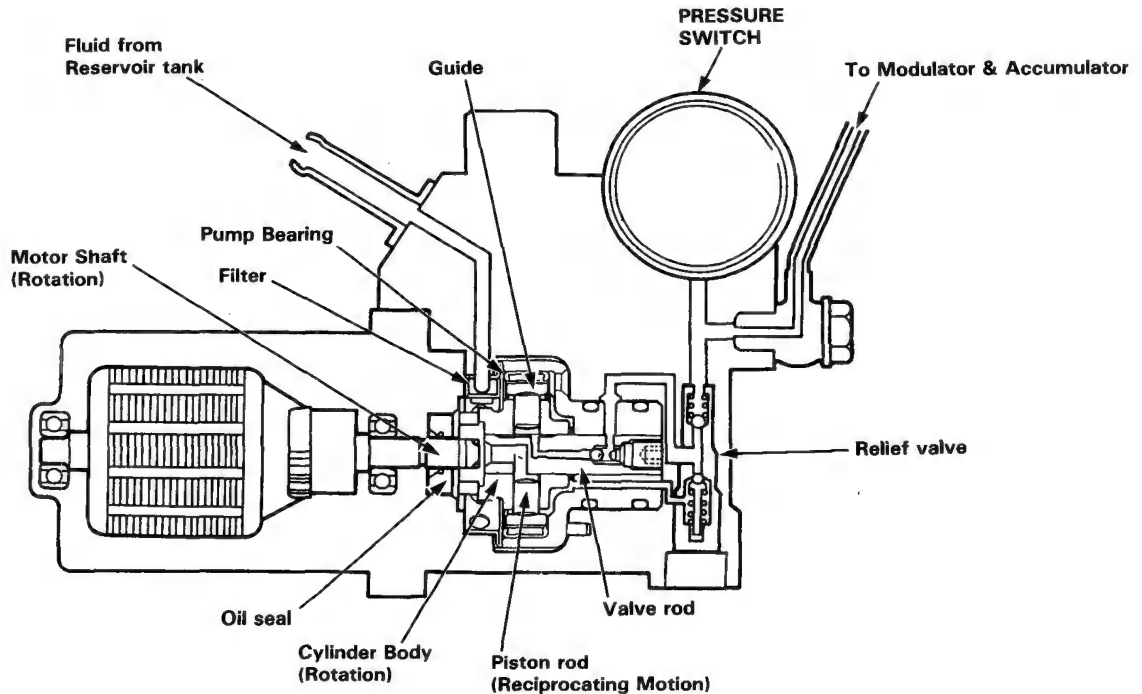
Features/Construction/Operation (cont'd)

Power Unit

The power unit consists of a motor, filter, guide, piston rod and cylinder body. Since a guide is positioned off-set to the center of the motor shaft, the rotation of the motor and cylinder body provides the reciprocating motion to the piston rod. The brake fluid is thus pressurized and fed to the relief valve, accumulator and modulator.

As the pressure in the accumulator exceeds the prescribed level, the pressure switch is turned on. Approx. 0.5 seconds after receiving the ON-signal, the control unit stops the motor relay operation. In this state, the pressure in the accumulator reaches 230 kg/cm².

If the pressure doesn't reach the prescribed value after the motor has operated continuously for a specified period, the control unit stops the motor and activates the anti-lock brake system indicator light.



Anti-Lock Brake System Indicator Light

This warning system turns on the anti-lock brake indicator light when one or more of the below described abnormalities is detected. This is only a partial list.

- When the operating time of the motor in the power unit exceeds the specified period.
- When vehicle running time exceeds 30 seconds without releasing the parking brake lever.
- When one of the rear wheels is locked during running.
- When absence of speed signals from any of the four speed sensors is detected.
- When the activation time of all solenoids exceeds a given time or an open circuit is detected in the solenoid system.
- When solenoid output is not detected in the simulated anti-lock brake system operation carried out during running at speeds of 6 mph (10 km/h) or more.

To check the indicator light bulb, the light is activated when the ignition switch is turned on. It is turned off after the engine is started if there is no abnormality in the system.

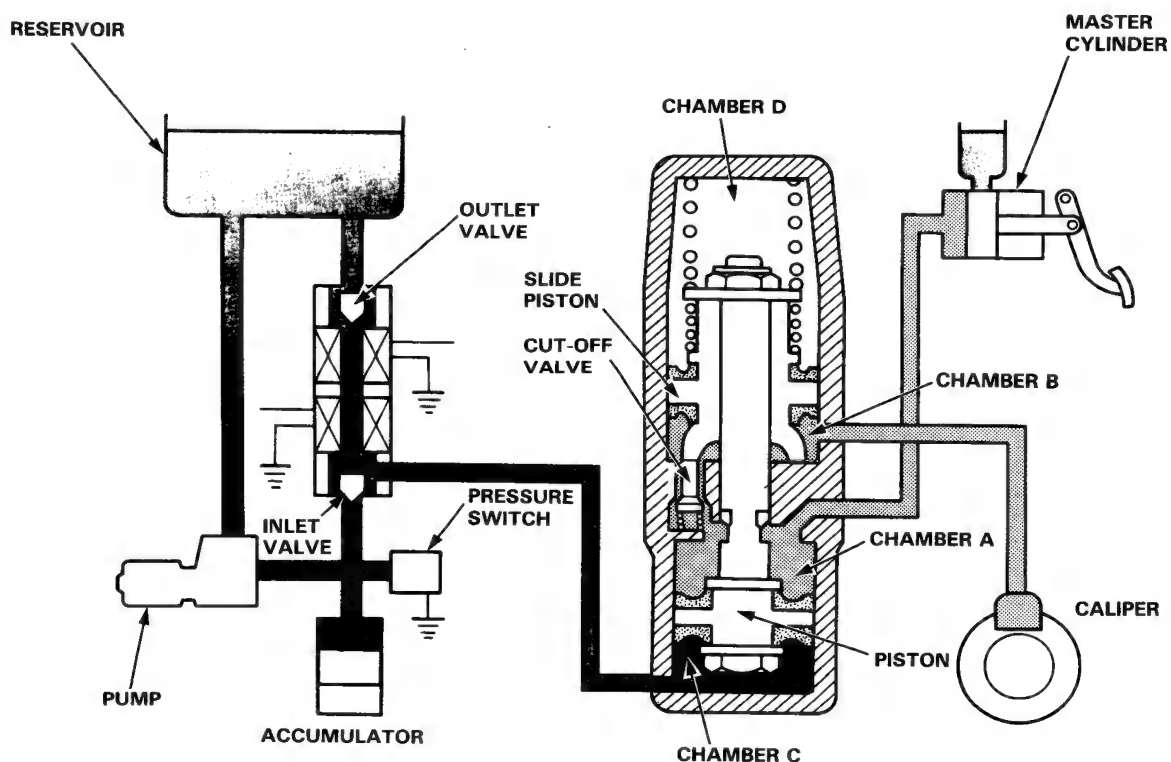
Opeartion

1. Ordinary Braking Function

In ordinary brake operations, the cut-off valve in the modulator is open, transmitting the hydraulic pressure from the master cylinder to the brake calipers via chamber A and chamber B.

Chamber C is connected to the reservoir through the outlet valve, which is normally open. It is also connected to the hydraulic pressure source (pump, accumulator, pressure switch, etc.) via the inlet valve, which is normally closed.

Chamber D serves as an air chamber. Under these conditions, the pressures of chambers C and D are maintained at about atmospheric pressure, permitting regular braking operations.



(cont'd)

Anti-lock Brake System

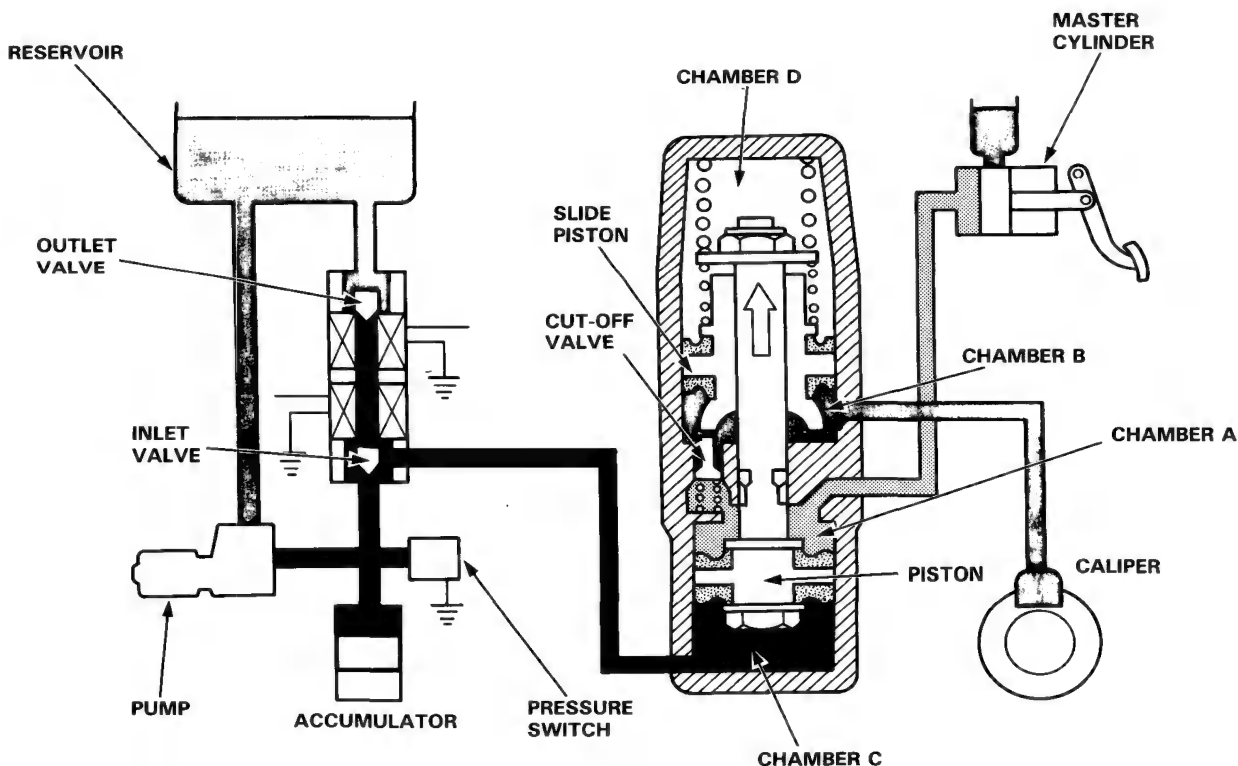
Features/Construction/Operation (cont'd)

If brake inputs (force exerted on brake pedal) are excessively large and a possibility of wheel locking occurs, the control unit operates the solenoid valve, closing the outlet valve and opening the inlet valve. As a result, the high pressure is directed into chamber C, the piston is pushed upward, causing the slide piston to move upward and the cut-off valve to close. As the cut-off valve closes, the flow from the master cylinder to the caliper is interrupted, the volume of chamber B, which is connected to the caliper, increases, and the fluid pressure in the caliper declines.

When both of the valves, inlet and outlet, are closed (when only the outlet valve is activated) the pressure in the caliper is maintained constant.

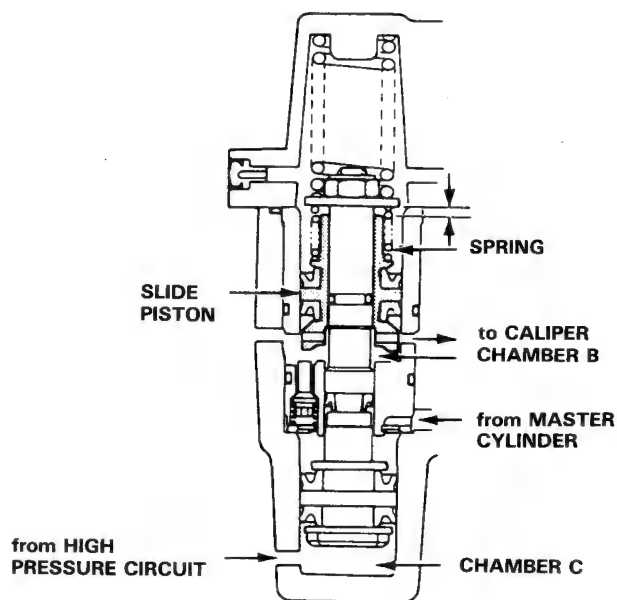
When the possibility of wheel locking ceases, it is necessary to restore the pressure in the caliper. The solenoid valve is therefore turned off (outlet valve: open, inlet valve closed).

Process	Caliper Pressure	Outlet Valve		Inlet Valve	
		Electric Power	Hydraulic Circuit	Electric Power	Hydraulic Circuit
Caliper pressure declining	→	ON	Close	ON	Open
Caliper pressure constant	→	ON	Close	OFF	Close
Caliper pressure increasing	→	OFF	Open	OFF	Close



2. Slide Piston Function

When the car is used on rough roads where the tires sometimes lose adhesion, the anti-lock brake system may function excessively, causing a very large volume of brake fluid to flow into chamber C. When this occurs, the piston is moved excessively, resulting in an abnormal loss of pressure in chamber B. In order to overcome this problem, the slide piston is kept in proper position by spring force to prevent the pressure in chamber B from becoming negative.



(cont'd)

Anti-lock Brake System

Features/Construction/Operation (cont'd)

3. Kickback

When the anti-lock brake system is functioning, the piston moves upward, the volume of chamber B increases, and the fluid pressure on the caliper side is reduced. At the same time, the volume of chamber A is reduced and the brake fluid is returned to the master cylinder. When the brake fluid is pushed back to the master cylinder, the driver can feel the functioning of the anti-lock brake system because the brake pedal is kicked back.

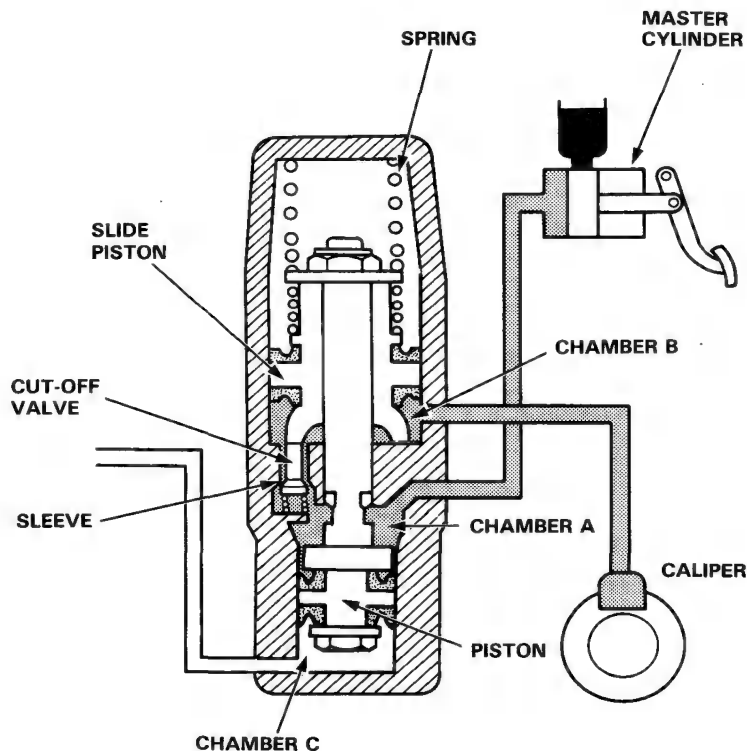
4. PCV (Proportioning Control Valve) Function

In the modulator for the rear wheels, the diameters of the piston and the slide piston are distinctly different. This provides a PCV (Proportioning Control Valve) function to prevent the rear wheels from locking during an emergency stop.

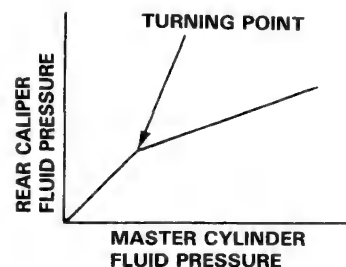
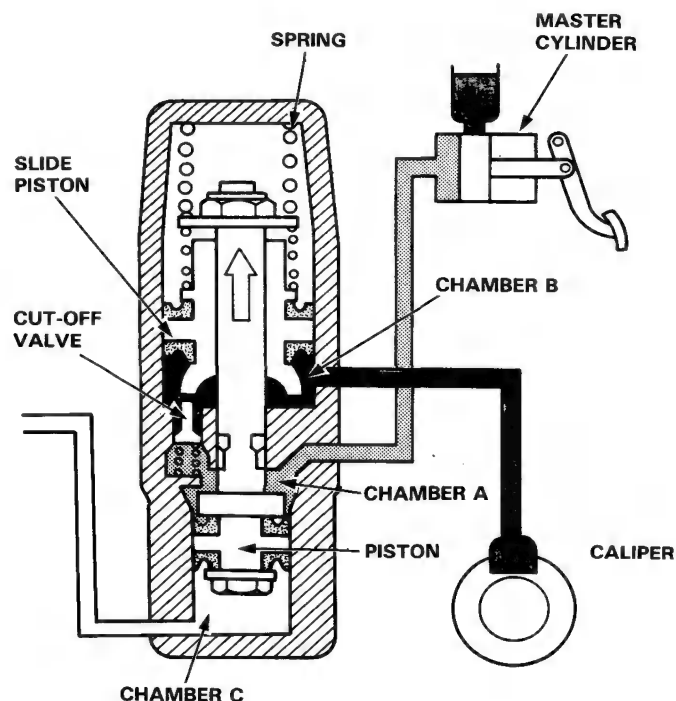
(1) Before the Turning Point:

- 1) When the fluid pressure from the master cylinder is below the turning point, the cut-off valve is always pushed downward by the force of the slide piston and its spring.

Under these conditions, there is a gap between the cut-off valve shoulder and the sleeve. Chamber A and chamber B are therefore connected through the gap. The pressure from the master cylinder flows into the rear calipers through chamber A and chamber B.



- 2) When the fluid pressure from the master cylinder reaches the turning point, the force on the slide piston overcomes the force of the spring, causing the slide piston to travel upward. The cut-off valve, previously being in contact with the bottom of the slide piston, then moves upward and the cut-off valve shoulder hits the sleeve, blocking the fluid passages (the fluid pressure at this point is called the turning point).



- (2) After the turning point:

As the fluid pressure from the master cylinder increases, the pressure in chamber A becomes higher, causing a force to push down the large diameter portion of the piston. Consequently, the slide piston comes down, the cut-off valve is pushed downward by the bottom of the slide piston, allowing chambers A and B to connect momentarily. As this occurs, pressure in chamber B increases, the slide piston is pushed upward, the cut-off valve goes up, and the connection between chamber A and chamber B is blocked again. As described above, when the pressure in the master cylinder is above the turning point, the slide piston reduces the pressure in the rear caliper to the prescribed amount by repeating this process.

(cont'd)

Anti-lock Brake System

Features/Construction/Operation (cont'd)

Dog Clutch (4WD only)

1. Features

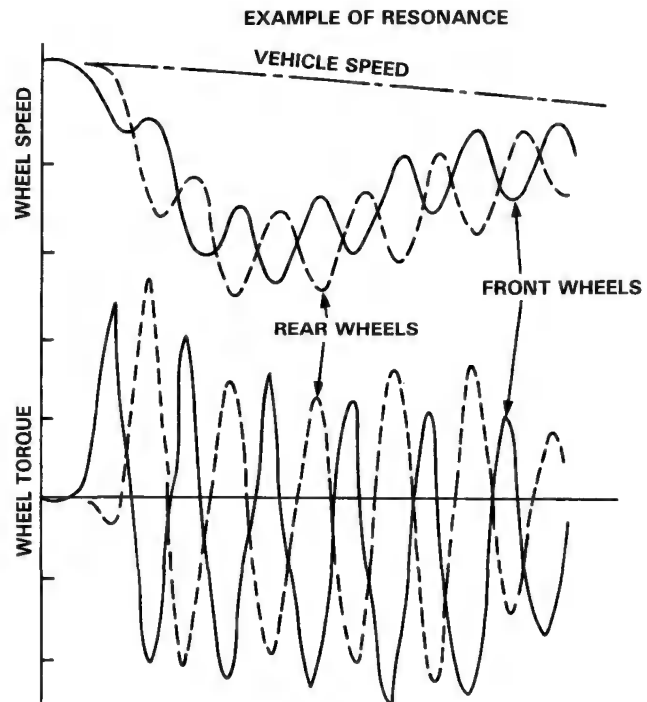
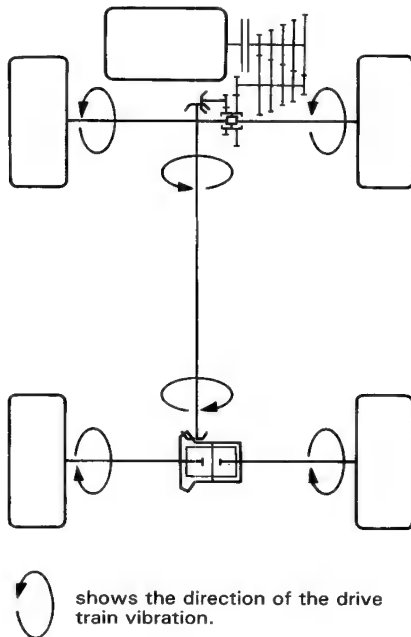
The dog clutch is installed in the front of the rear differential and is used to prevent the body vibration peculiar to 4WD vehicle. It is controlled by the ABS control unit and is shifted from 4WD to 2WD during ABS operation.

The ABS modulates the pressure of the brake fluid applied to each front caliper or both rear calipers whenever the wheels are likely to be locked due to hard braking. It then restores normal hydraulic pressure when there is no longer any possibility of wheel locking.

Therefore the brake hydraulic pressure is increased and decreased repeatedly during ABS operation.

On 4WD vehicle, the front and rear wheels are connected with the propeller shaft. When the vibration mode peculiar to 4WD drive train resonates with the increase and decrease cycle of the brake hydraulic pressure, the vibration of the drive train occurs and the driver feels it as a body vibration.

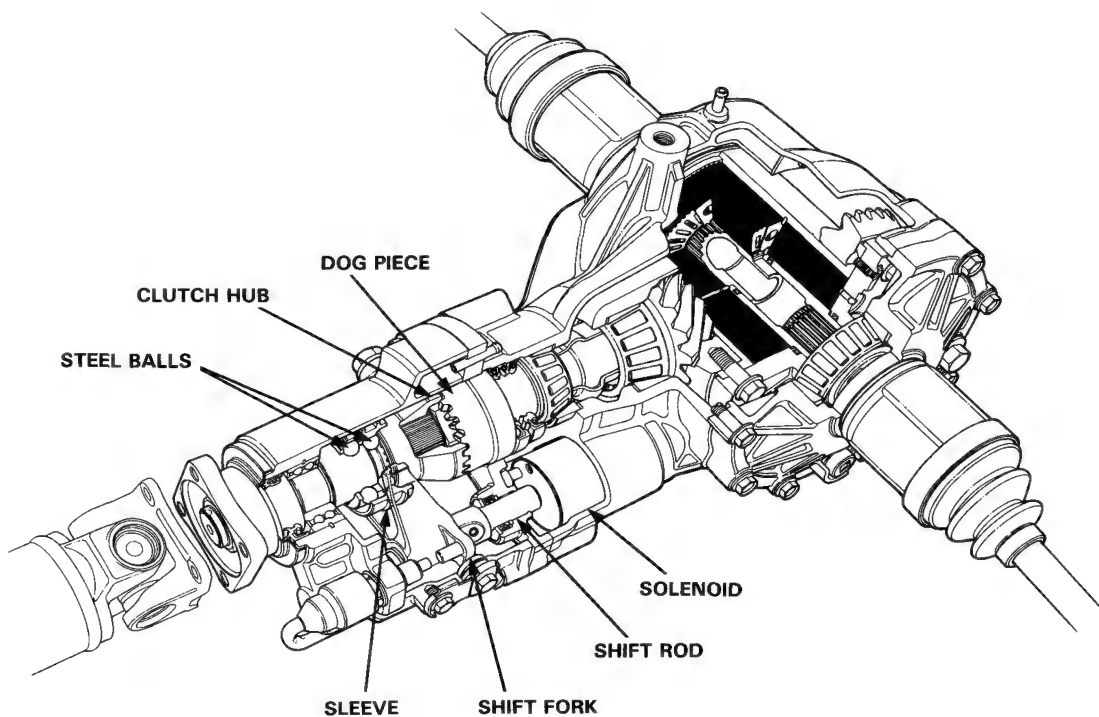
To prevent this vibration, when the ABS control unit determines to operate the ABS during braking, it disengage the dog clutch via the two clutch relays.



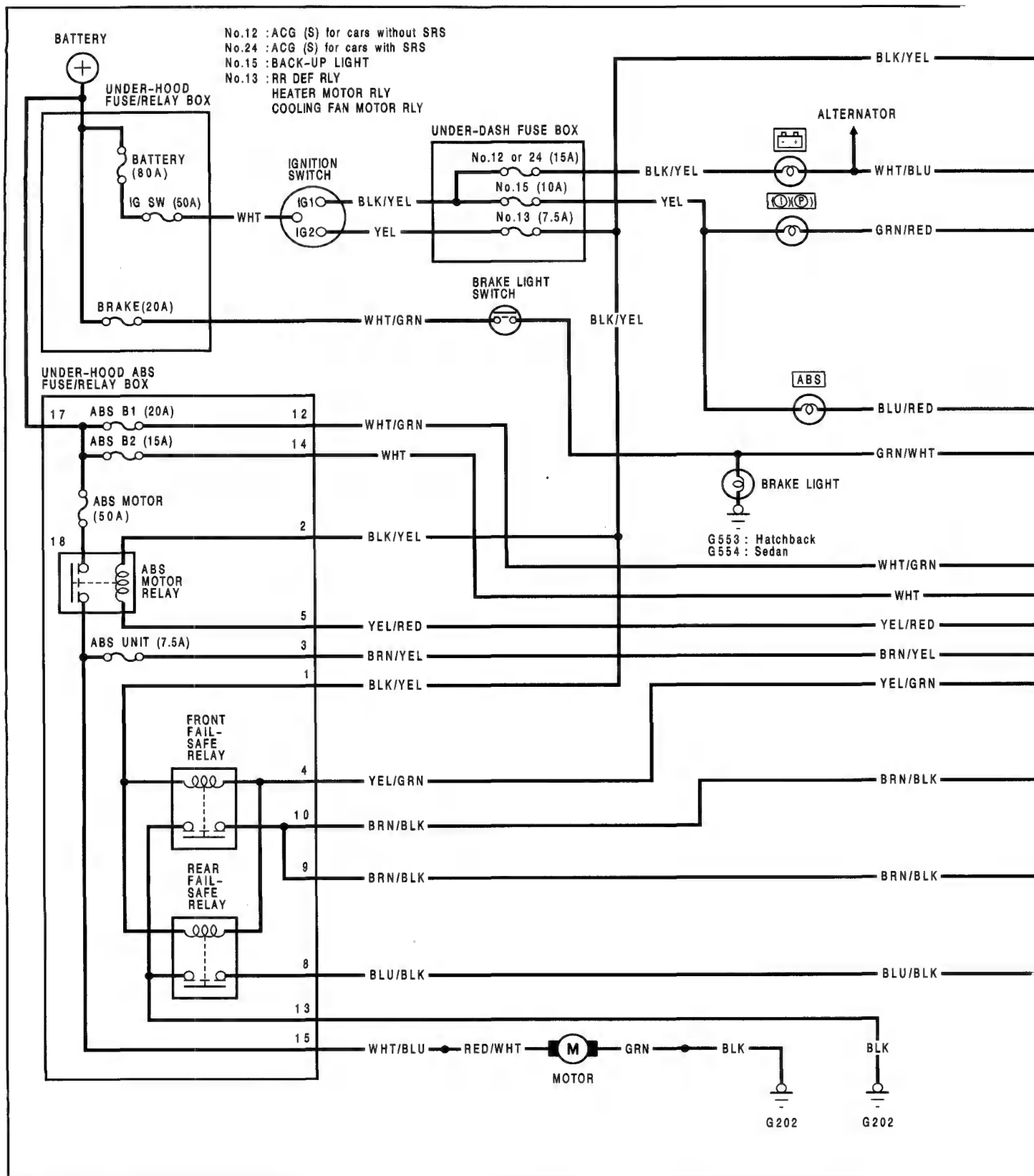
2. Operation

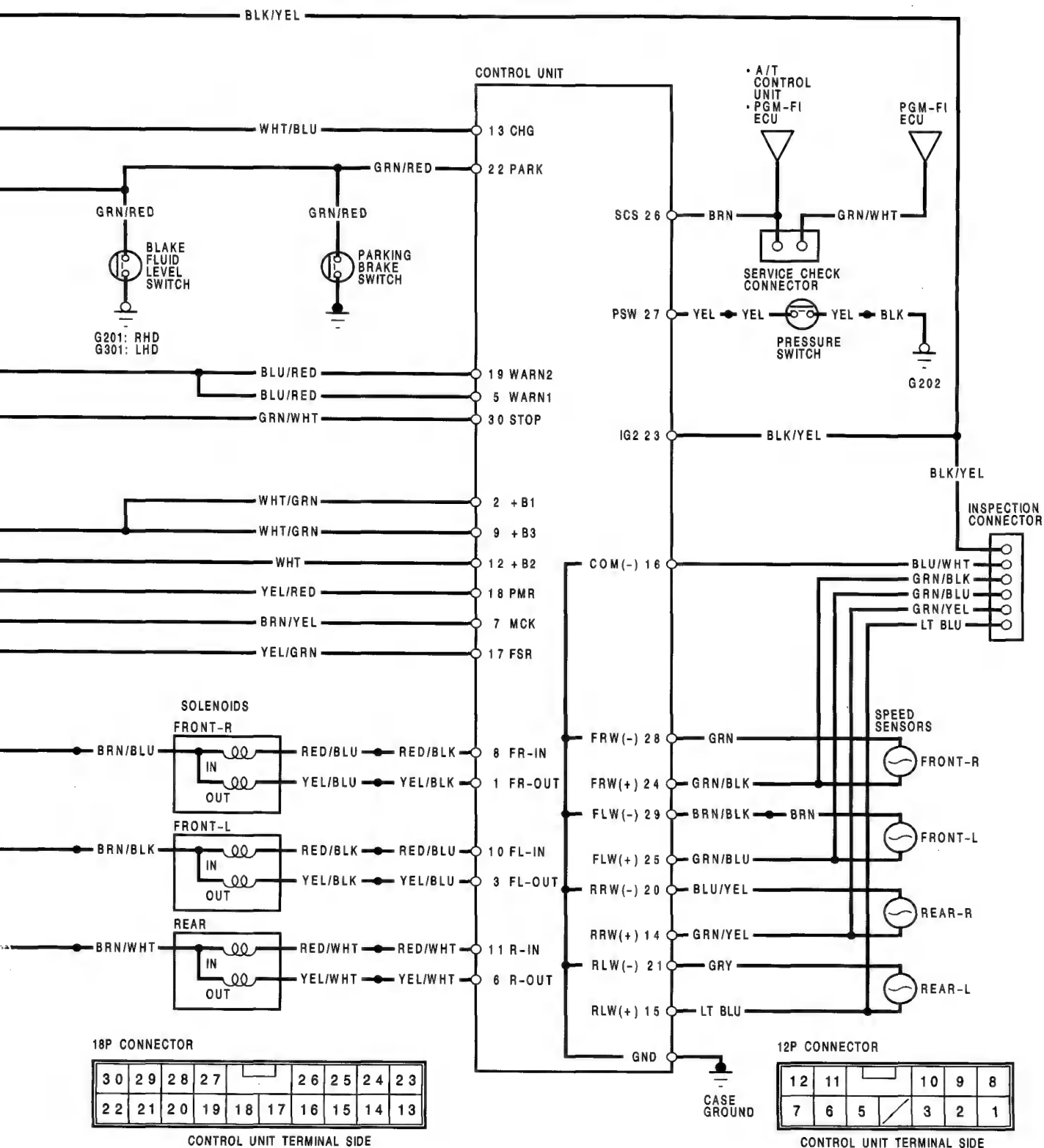
The dog clutch system consists of the solenoid, shift mechanism, hub mechanism and stroke switch.

- (1) When the control unit determines to shift the dog clutch from 4WD to 2WD, it sends the signal to the relay to operate the solenoid.
- (2) The solenoid shifts the shift rod.
- (3) The shift fork attached to the shift rod moves the sleeve forward.
- (4) The sleeve moves the clutch hub forward via the steel balls.
- (5) The shift fork pushes the stroke switch and the switch sends a signal that the clutch is disengaged, to the control unit.
- (6) When the control unit determines to restore the vehicle to 4WD, it turns off relay and solenoid, and the shift fork is pushed back by the spring force.

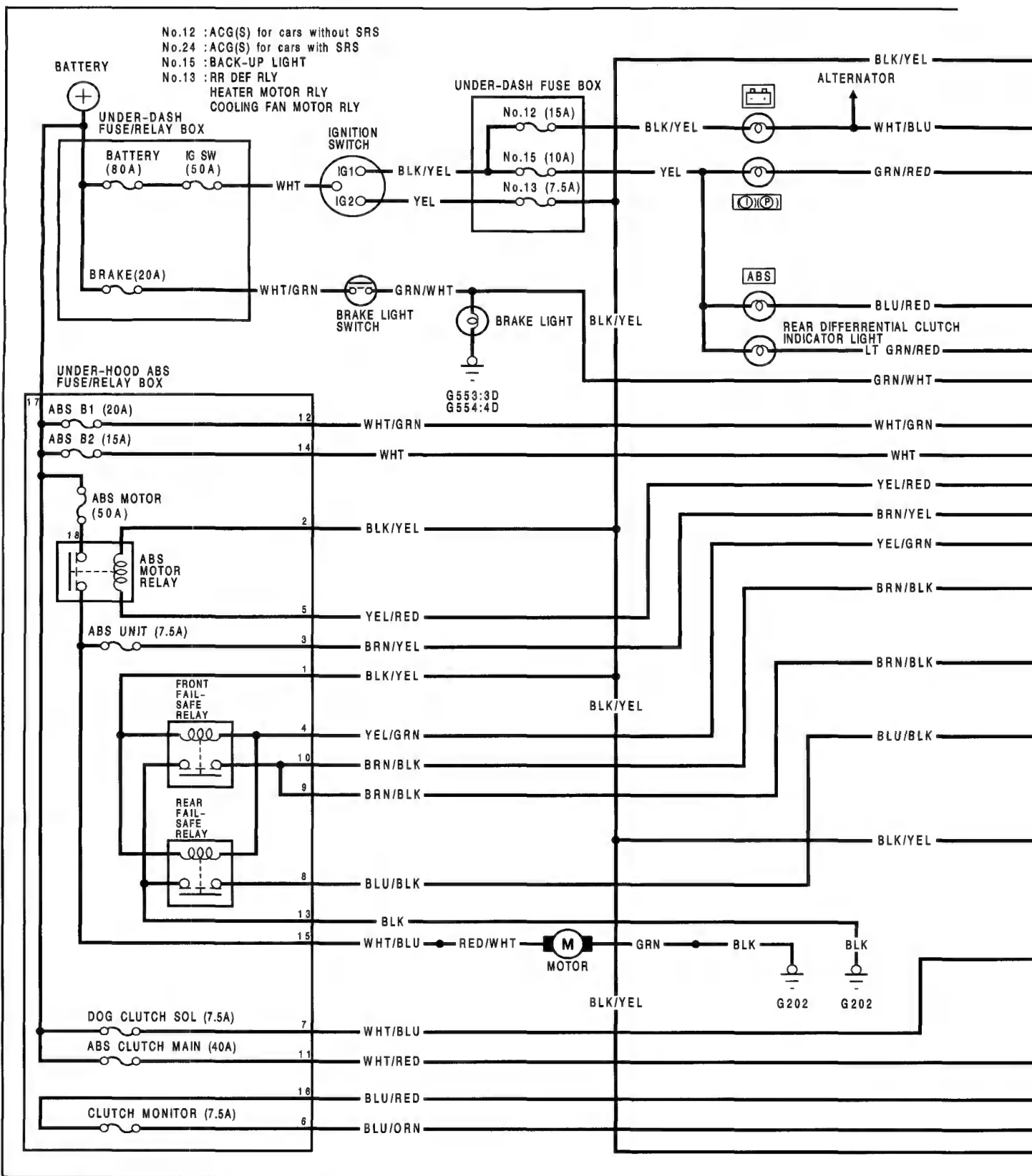


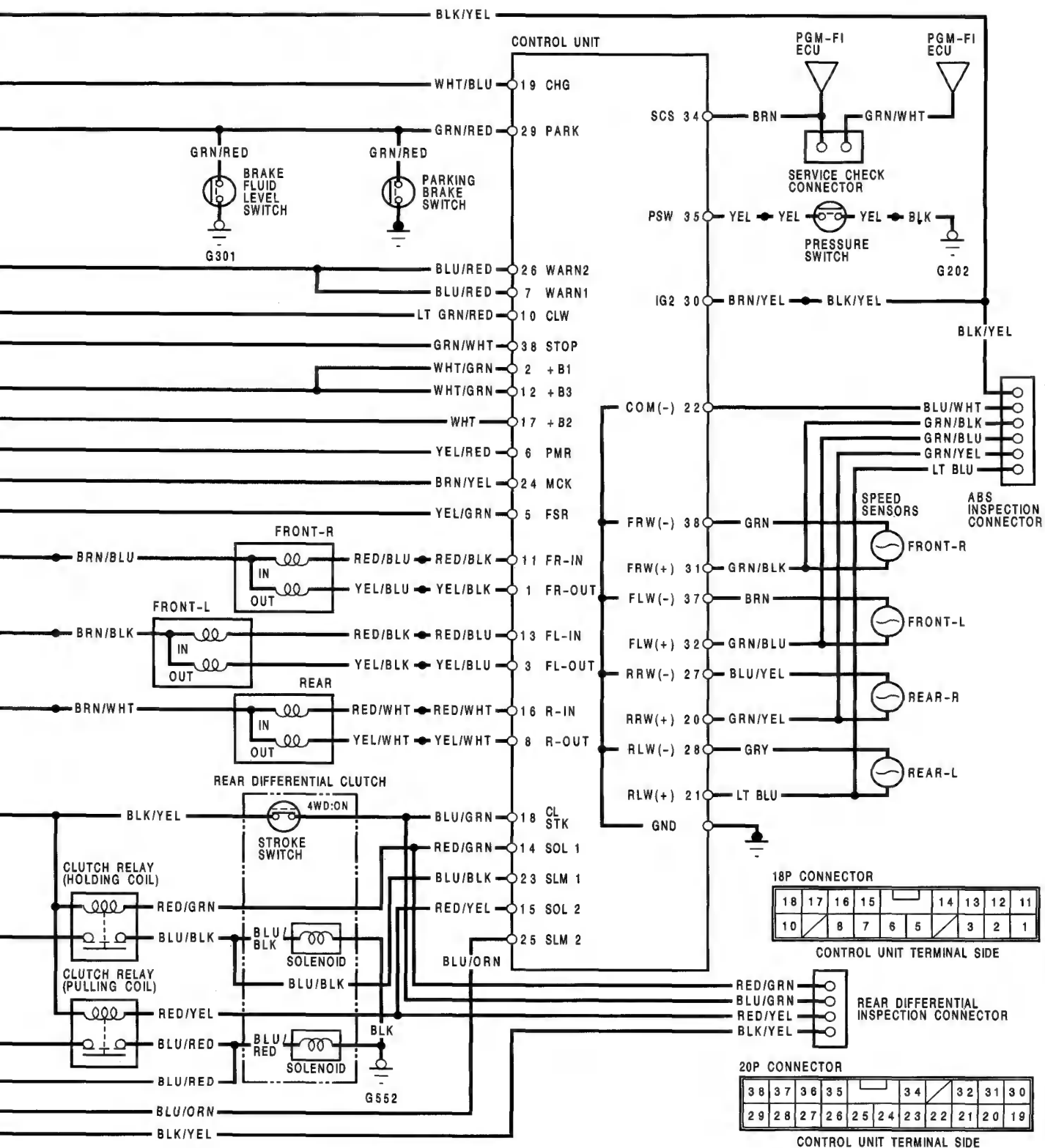
Circuit Diagram (2WD)



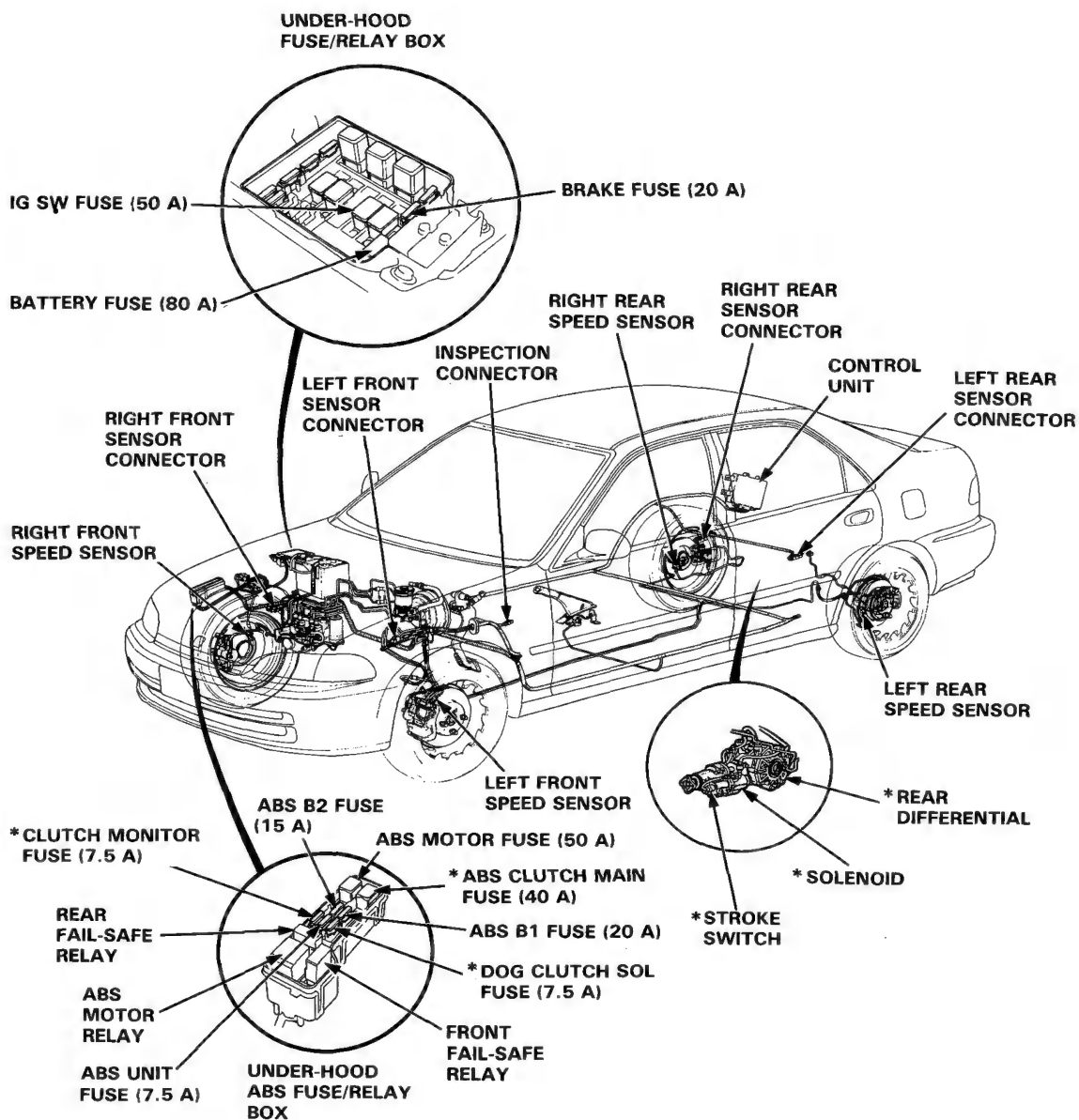


Circuit Diagram (4WD)





Wiring/Connector Locations



* 4WD only

ALB Checker



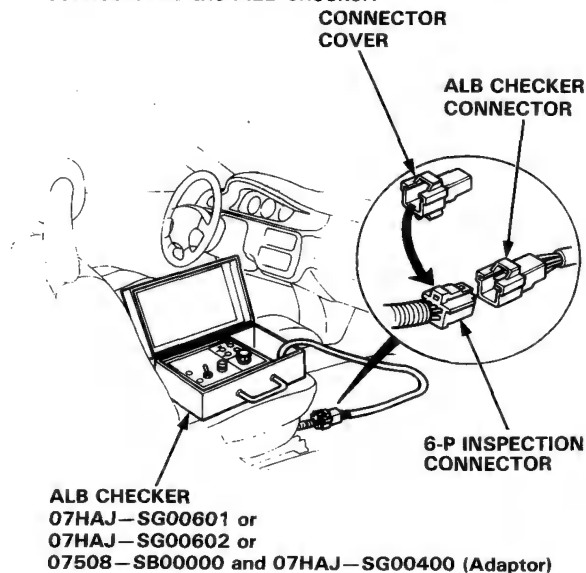
Function Test

NOTE:

- The ALB checker is designed to confirm proper operation of the anti-lock brake system by simulating each system function and operating condition. Before using the checker, confirm that the anti-lock brake system indicator light is not indicating some other problem with the system. The light should go on when the ignition is first turned on and then go off and stay off one second after the engine is started.
- The checker should be used through modes 1—5 to confirm proper operation of the system in any one of the following situations:
 - After replacing any anti-lock brake system component.
 - After replacing or bleeding the system fluid (0 mode not necessary).
 - After any body or suspension repair that may have affected the sensors or their wiring.
- The procedure for modes 1—5 are on this page and 19-56, mode 0 (wheel sensor signal) is on page 19-57.
- Use the following models of ALB checkers:
 - 07HAJ—SG00601 or
 - 07HAJ—SG00602 or
 - 07508—SB00000 and
 - 07HAJ—SG00400 (Adaptor)

WARNING Disconnect the ALB checker before driving the car. A collision can result from a reduction, or complete loss, of braking ability causing severe personal injury or death.

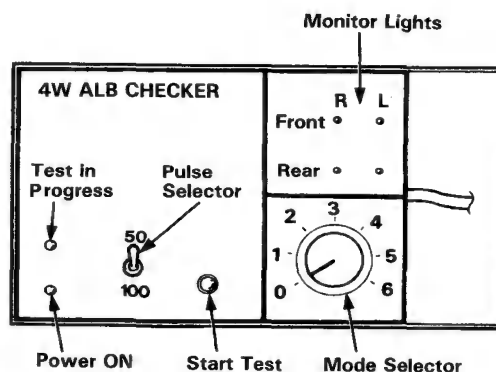
1. With the ignition switch off, disconnect the 6-P inspection connector from the connector cover located on the cross-member under the passenger's seat and connect the 6-P inspection connector to the ALB checker.



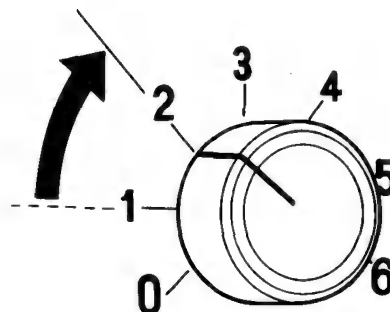
NOTE: Place the vehicle on level ground with the wheels blocked, put the transmission in neutral for manual transmission models, and in P for automatic transmission models.

2. Start the engine and release the parking brake.
3. Operate the ALB checker as follows:
 - (1) Set the pulse selector switch to 50.
 - (2) Turn the Mode Selector switch to "1".
 - (3) Push the Start Test switch:
 - The test in progress light should come ON.
 - In one or two more seconds, all four monitor lights should come on (If not the checker is faulty).
 - The anti-lock brake system indicator light should not come ON (If it comes on the checker harness to the 6-P connector connection is faulty).

NOTE: When the test in progress indicator light is ON, don't turn the Mode Selector switch.



4. Turn the Mode Selector Switch to "2".



(cont'd)

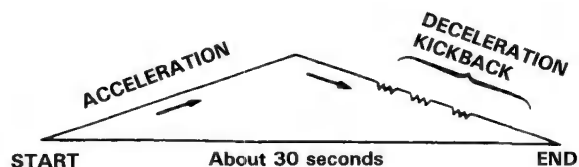
ALB Checker

Function Test (cont'd)

5. Depress the brake pedal firmly and push the Start Test switch.

The anti-lock brake system indicator light should not go on while the Test in Progress light is ON. There should be kickback on the brake pedal. If not as described, go to troubleshooting, page 19-66.

NOTE: The operation sequence simulated by Modes 2, 3, 4 and 5:



6. Turn the Mode Selector switch to 3, 4 and 5. Perform step 5 for each of the test mode positions.

Mode 1:

Sends the simulated driving signal 0 km/h (0 mph) → 180 km/h (112.5 mph) → 0 km/h (0 mph) of each wheel to the control unit to check the control unit self diagnosis circuit. There should be NO kickback.

Mode 2:

Sends the driving signal of each wheel, then sends the lock signal of the left rear wheel to the control unit. There should be kickback.

Mode 3:

Sends the driving signal of each wheel, then sends the lock signal of the right rear wheel to the control unit. There should be kickback.

Mode 4:

Sends the driving signal of each wheel, then sends the lock signal of the left front wheel to the control unit. There should be kickback.

Mode 5:

Sends the driving signal of each wheel, then sends the lock signal of the right front wheel to the control unit. There should be kickback.

Mode 6:

Not used on this model.

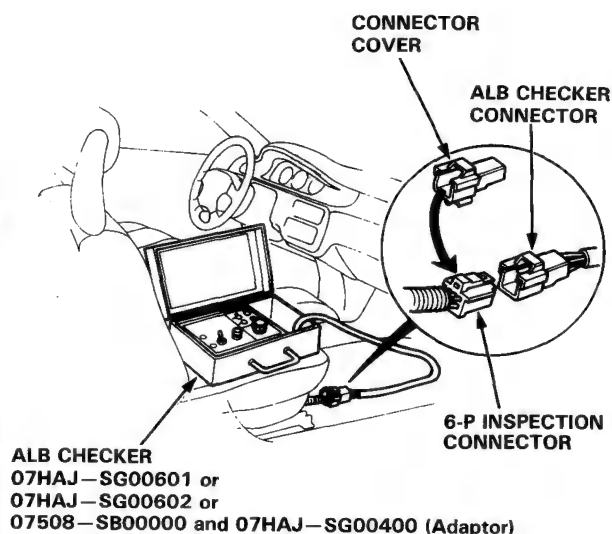
Inspection points:

1. The anti-lock brake system indicator light comes ON in mode 1.
 - Check the wiring.
2. There is no kickback in modes 2 through 5.
 - Shorted wires.
 - Faulty or disconnected pump assembly connector.
 - Faulty pump assembly.

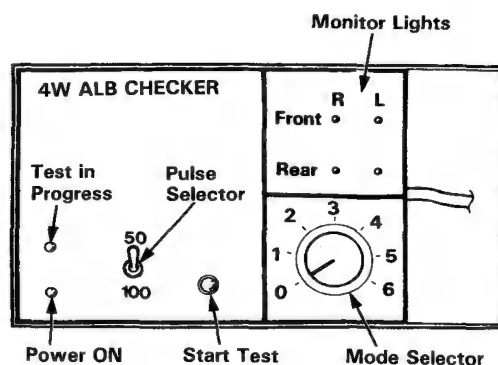
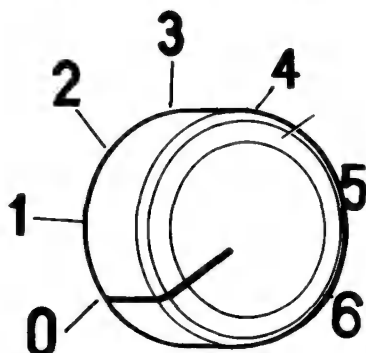
Wheel Sensor Signal Confirmation

NOTE: Use the ALB checker (mode 0) to confirm proper wheel sensor operation.

1. Disconnect the 6-P inspection connector from the connector cover located on the cross-member under the passenger's seat and connect the 6-P inspection connector to the ALB checker.



2. Raise the car so that all four wheels are off the ground and support on safety stands.
3. Set the pulse selector switch to 50.
4. Turn the ignition switch ON.
5. Turn the Mode Selector switch to "0".



6. With the transmission in neutral, rotate each wheel briskly (one revolution per second) by hand, and confirm that its respective monitor light on the checker blinks as the wheel rotates.

NOTE:

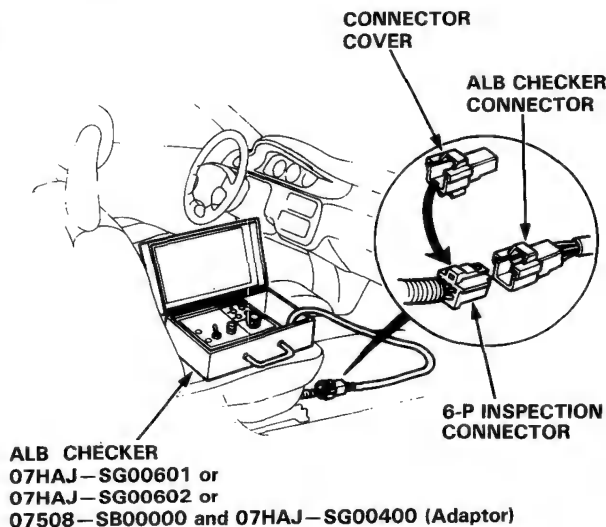
- Rotating a wheel too slowly will produce only a weak blink of its monitor light that may be difficult to see.
- In bright sunlight, the monitor light may be difficult to see. Perform tests in a shaded area.
- In some instances, it may not be possible to spin the front wheels fast enough to get a monitor indication. If necessary, start the engine and slowly accelerate and decelerate the front wheels. The monitor lights should blink, indicating a good wheel sensor signal.

If any monitor light fails to blink, check the suspected sensor, its air gap and its wiring/connectors.

Troubleshooting

Dog Clutch Inspection Using ALB Checker

1. Perform the ABS function test with ALB checker to check that there are no problems or abnormalities.
2. Turn the ignition switch ON and check that the rear differential clutch warning light comes on. If it does not come on, go to troubleshooting, page 19-68.
3. With the ignition switch OFF, disconnect the 6-P inspection connector (ORN) from the connector cover located on the cross-member under the passenger's seat and connect the 6-P inspection connector to the ALB checker.

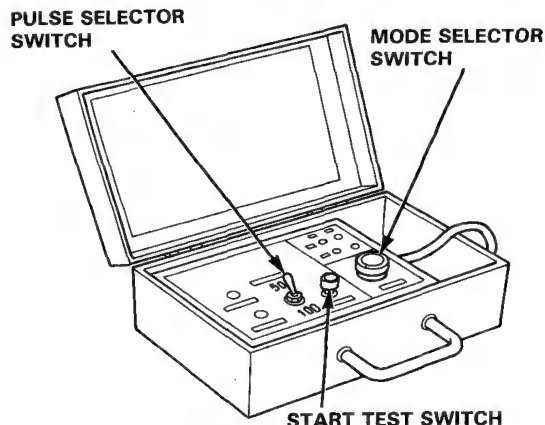


4. Block the front wheels, raise the rear of the car and support on safety stands.
5. Shift the transmission in neutral for manual transmission models, and in P for automatic transmission models.
6. Short the brake light switch terminal with a jumper wire.

NOTE: Although it is acceptable for assistant to depress the brake pedal instead of performing step 6, the wheels cannot be rotated in step 10 if the pedal is depressed firmly.

7. Start the engine and release the parking brake.
8. Set the Pulse Selector switch to 50.
9. Turn the Mode Selector switch to 4 or 5.
10. Push the Start Test switch.

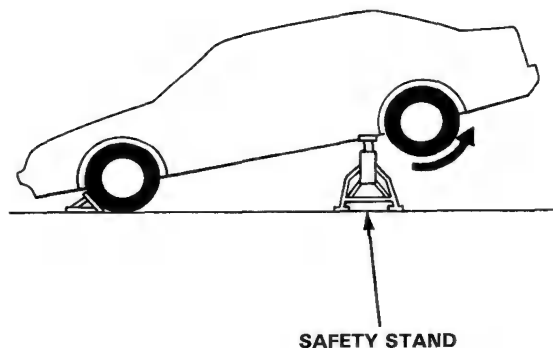
CAUTION: When the test in progress indicator light is ON, don't turn the Mode Selector switch.



11. Check if the rear wheels can be rotated by hand while solenoid operating sound is heard. If the rear wheels cannot be rotated, there is an open circuit in the related wire harness or the solenoid is faulty.

CAUTION: Do not use Mode 6 while testing.

⚠ WARNING Disconnect the ALB checker before driving the car. A collision can result from a reduction, or complete loss of braking ability causing severe personal injury or death.

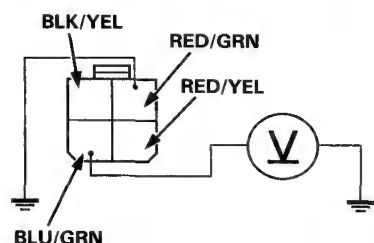


Dog Clutch Inspection Using Jumper Wires

CAUTION: To prevent the rear differential clutch solenoids from damage, do not leave the ignition switch on for more than 5 minutes and do not ground the RED/YEL wire (pulling solenoid) for more than 5 seconds while testing.

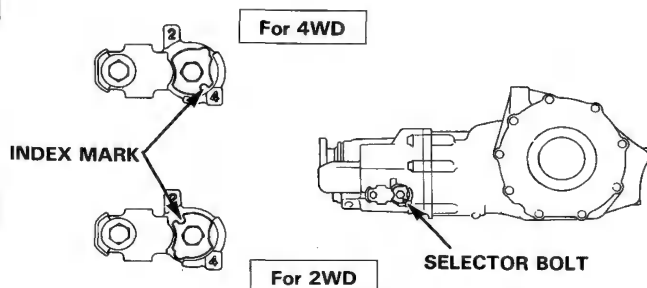
1. With the ignition switch OFF, disconnect the 4-P inspection connector (ORN) from the connector cover located on the cross-member under the passenger's seat. Ground the RED/GRN terminal (holding solenoid) to the body with a jumper wire and connect the voltmeter between the BLU/GRN terminal and body ground.

4-P INSPECTION CONNECTOR



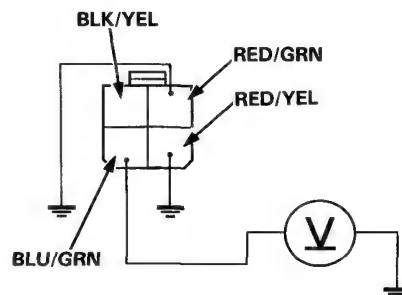
View from terminal side.

2. Block the front wheels, raise the rear of the car and support on safety stands.
3. Make sure that the selector bolt of the rear differential is set to 4WD.



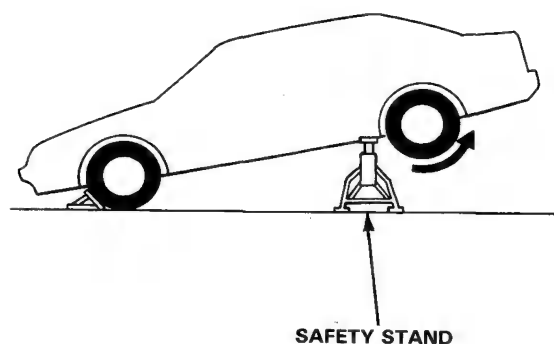
4. Turn the ignition switch ON.
5. Check that the voltmeter shows the battery voltage. If it shows 0 V, the stroke switch circuit is defective or the dog clutch is faulty (2WD position).
6. Ground the RED/YEL terminal to the body with a different jumper wire for an instant (less than 5 seconds).

4-P INSPECTION CONNECTOR



View from terminal side.

7. Check that the voltmeter shows 0 V and that the rear wheels can be rotated by hand.
 - If the rear wheels cannot be rotated, there is an open circuit in the related wire harness or the solenoid is faulty.
 - If the rear wheels can be rotated but the voltmeter does not show 0 V, the stroke switch is faulty.



Troubleshooting

Anti-lock Brake System Indicator Light

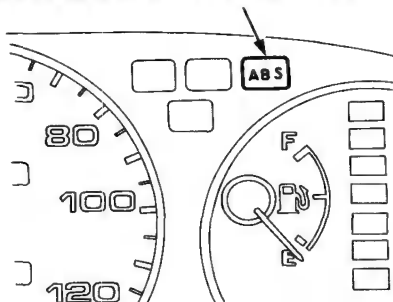
Temporary Driving Conditions:

1. The anti-lock brake system indicator light comes on and the control unit memorizes the problem under certain conditions.

NOTE: Problem codes are explained on page 19-60.

- The tire(s) adhesion is lost due to excessive cornering speed.
Problem codes: 5, 5-4, 5-8.
 - The vehicle loses traction when starting from a stuck condition on a muddy, snowy, or sandy road.
Problem code: 4-1, 4-2, 4-4, 4-8.
 - When the parking brake is applied for more than 30 seconds while the vehicle is being driven.
Problem code: 2-1.
 - The vehicle is driven on an extremely rough road.
2. The anti-lock brake system is OK if the anti-lock brake system indicator light goes off after the engine is restarted.

ANTI-LOCK BRAKE SYSTEM INDICATOR LIGHT



3. If you receive a customer's report that the anti-lock brake system indicator light sometimes comes on, check the system using the ALB checker to confirm whether there is any trouble in the system.
See page 19-61.
4. The anti-lock brake system indicator light will come on and the control unit will memorize a problem code when there is insufficient battery voltage to the control unit. An example would be when the battery is so weak that the car must be jump-started. After the battery is sufficiently recharged, the anti-lock brake system indicator light will work normally after the engine is stopped and restarted.

However, after recharging the battery, the problem code must be cleared from the control unit's memory by disconnecting the ABS B2 (15 A) fuse for at least 3 seconds.

Anti-lock Brake System Indicator Light Circuit:

CAUTION: Use only the digital multimeter to check the system.

1. The indicator light does not go on when the ignition switch is turned on.

Check the following items. If they are OK, check the control unit connectors. If not loose or disconnected, substitute a known-good control unit and recheck:

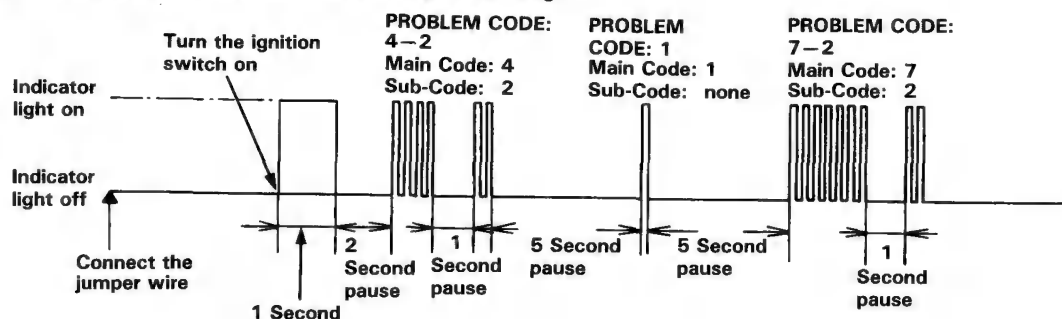
- Blown anti-lock brake system indicator light bulb.
 - Open circuit in YEL wire between the No. 15 BACK-UP LIGHT (10 A) fuse and gauge assembly.
 - Open circuit in BLU/RED wire between the gauge assembly and control unit.
 - Poor ground connection between the control unit and the body.
2. The anti-lock brake system indicator light remains ON after the engine is started, however the anti-lock brake system indicator light does not blink any code or sub-code. Check the following items:
- Loose or poor connection of the wire harness at the control unit.
 - Faulty ABS B2 (15 A) fuse.
 - Open circuit in WHT wire between the ABS B2 (15 A) fuse and control unit.
 - Open circuit in BLK/YEL wire between the No. 13 RR DEF RLY/HEATER MOTOR RLY/COOLING FAN MOTOR RLY (7.5 A) fuse and control unit.
 - Short circuit in BLU/RED wire between gauge assembly and control unit.
 - Open circuit in WHT/BLU wire between alternator and control unit.

If the problem is not found, substitute a known-good control unit and recheck whether the anti-lock brake system indicator light remains ON.

Comes on and remains on while running:

1. Stop the engine.
2. Turn the ignition switch on and make sure that the anti-lock brake system indicator light comes on.
3. Restart the engine and check the anti-lock brake system indicator light.
 - There is no problem in the anti-lock brake system if the anti-lock brake system indicator light goes off.
 - Go to step 4 if the anti-lock brake system indicator light goes off and then comes back on.
4. Stop the engine.
5. Disconnect the service check connector from the connector cover located under the glove box. Connect the two terminals of the service check connector with a jumper wire.
6. Turn the ignition switch on, but do not start the engine.
7. Record the blinking frequency of the anti-lock brake system indicator light. The blinking frequency indicates the problem code.

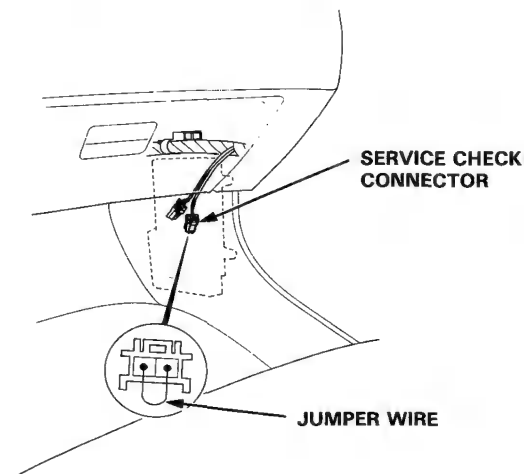
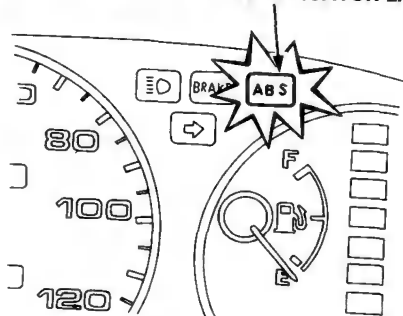
CAUTION: Before starting the engine, disconnect the jumper wire from the service check connector, or else the Check Engine light will stay on with the engine running.



NOTE:

- The control unit can indicate three problem codes (one, two or three problems).
- If the anti-lock brake system indicator light does not light, see Troubleshooting of Anti-lock Brake System Indicator Light Circuit page 19-66.
- If you miscount the blinking frequency, turn the ignition switch off then on to cycle the anti-lock brake system indicator light again.
- After the repair is completed, disconnect the ABS B2 (15 A) fuse for at least 3 seconds to erase the control unit's memory. Then turn the ignition key on again and recheck.
- The memory is erased if the connector is disconnected from the control unit or the control unit is removed from the body.
- After recording the main and sub-code (if applicable), refer to the Symptom-to-System Chart.

ANTI-LOCK BRAKE SYSTEM INDICATOR LIGHT



Troubleshooting

Rear Differential Clutch Indicator Light

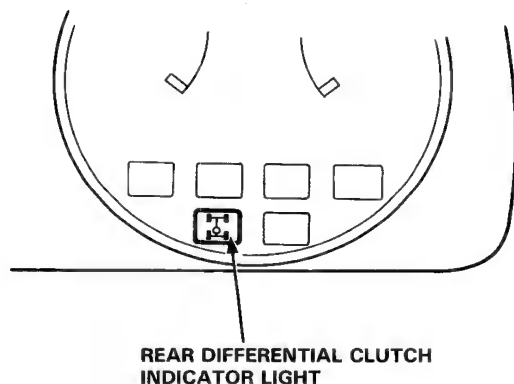
Rear Differential Clutch Indicator Light Circuit:

CAUTION: Use only the digital multimeter to check the system.

1. The indicator light does not come on when the ignition switch is turned ON.

Check the following items. If they are OK, check the control unit connectors. If not loose or disconnected, substitute a known-good control unit and recheck.

- Blown rear differential clutch indicator light bulb.
- Open circuit in YEL wire between the No. 15 BACK-UP LIGHT (10A) fuse and gauge assembly.
- Open circuit in LT GRN/RED wire between the gauge assembly and control unit.
- Poor ground connection between the control unit and the body.



2. The rear differential clutch indicator light remains on after the engine is started and the brake pedal is depressed, however the ABS (Anti-lock Brake System) indicator light does not blink any code or sub-code. Check the following items:

NOTE: If both ABS and rear differential clutch indicator lights do not go off, check the ABS indicator light system first.

- Loose or poor connection of the wire harness at the control unit.
- Short circuit in LT GRN/RED wire between the gauge assembly and control unit.
- Open circuit in GRN/WHT wire between the brake light switch and control unit.

If the problem is not found, substitute a known-good control unit and recheck whether the rear differential clutch indicator light remains on.

Relation Between ABS Warning and Rear Differential Warning

NOTE: In the table below, "clutch" means "rear differential clutch".

Diagnosis	First action just after malfunction is detected	Second action after first action
ABS: Normal Clutch system: Abnormal	<ul style="list-style-type: none"> • Clutch indicator light comes on. • Clutch relay is turned off (Clutch is shifted to 4WD). • Problem code is memorized. 	<ul style="list-style-type: none"> • Clutch control and diagnosis are stopped. • ABS is controlled normally (in 4WD).
ABS: Abnormal in 4WD Clutch system: Normal	<ul style="list-style-type: none"> • ABS indicator light comes on. • Fail-safe relay is turned off. • Problem code is memorized. 	<ul style="list-style-type: none"> • ABS control is stopped. • Clutch control and diagnosis are stopped.
ABS: Abnormal during ABS operation (in 2WD) Clutch system: Normal	<ul style="list-style-type: none"> • ABS indicator light comes on. • Fail-safe relay is turned off. • Problem code is memorized. 	<ul style="list-style-type: none"> • ABS control is stopped. • Clutch is controlled to remain in 2WD until condition to shift the clutch from 4WD to 2WD are met (both front wheels turn at same speed). • After conditions are met and clutch is shifted to 4WD, clutch control and diagnosis are stopped.
ABS: Abnormal during ABS operation (in 2WD) ↓ Clutch system: Abnormal in 2WD	<ul style="list-style-type: none"> • ABS indicator light comes on. • Fail-safe relay is turned off. • (ABS) problem code memorized. ↓ <ul style="list-style-type: none"> • Clutch indicator light come on. • Clutch relay is turned off (Clutch is shifted to 4WD). • (Clutch system) problem code is memorized. 	<ul style="list-style-type: none"> • ABS control is stopped. ↓ <ul style="list-style-type: none"> • Clutch control and diagnosis are stopped.
Clutch system: Abnormal ↓ ABS: Abnormal in 2WD	<ul style="list-style-type: none"> • Clutch indicator light comes on. • Clutch relay is turned off (Clutch is shifted to 4WD). • Problem code is memorized. ↓ <ul style="list-style-type: none"> • ABS indicator light comes on. • Fail-safe relay is turned off. • Problem code is memorized. 	<ul style="list-style-type: none"> • Clutch control and diagnosis are stopped. • ABS is controlled normally (in 4WD). ↓ <ul style="list-style-type: none"> • ABS control is stopped.

CAUTION:

- Be sure to turn the ignition switch OFF when troubleshooting unless instructed to do so.
- Measure the impedance of the control unit with the ignition switch off and within 5 seconds.

Troubleshooting

Symptom-to-System Chart

PROBLEM CODE		PROBLEMATIC COMPONENT/ SYSTEM	AFFECTED				See page	OTHER COMPONENT	See page
MAIN CODE	SUB-CODE		FRONT RIGHT	FRONT LEFT	REAR RIGHT	REAR LEFT			
①	—	Pump motor over-run	—	—	—	—	19-71	Pressure switch	
	②	Pump motor circuit problem	—	—	—	—	19-73	Motor relay, Unit fuse, Motor fuse	19-122
	③	High pressure leakage	—	—	—	—	19-76	Solenoid	19-112
	④	Pressure switch	—	—	—	—	19-77		
	⑧	Accumulator gas leakage	—	—	—	—	19-78		
②	①	Parking brake switch-related problem	—	—	—	—	19-78	Brake fluid level switch BRAKE light	
③	①	Pulser(s)	○				19-123		
	②			○					
	④				○	○			
④	①	Speed sensor	○				19-79		
	②			○					
	④				○				
	⑧					○			
⑤	—	Speed sensor(s)			○	○	19-81	Modulator	
	④				○				
	⑧					○			
⑥	—	Fail-safe relay (Open, short)	—	—	—	—	19-83 (Function Test)	Front or rear fail-safe relay	19-122
	①		—	—	—	—		Front fail-safe relay	
	④		—	—	—	—		Rear fail-safe relay	
⑦	①	Solenoid related problem (Open)	○				19-89	ABS B1 fuse Front fail-safe relay	
	②			○					
	④				○	○	19-92	Rear fail-safe relay	
⑧	①	Rear differential clutch relay and stroke switch circuits	—	—	—	—	19-95	Clutch relays, Stroke switch	19-122
	②	Rear differential clutch holding coil relay and solenoid holding coil circuits	—	—	—	—	19-100	Clutch holding coil relay, Solenoid holding coil	19-122
	④	Rear differential clutch pulling coil relay and solenoid pulling coil circuits	—	—	—	—	19-104	Clutch pulling coil relay, Solenoid pulling coil	19-122

Flowcharts

Problem Code 1: Pump Motor Over-run

CAUTION: Use only the digital multimeter to check the system.

Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (page 19-109).

Remove the pump motor relay.

Connect the No. 16 and 18 terminals using a jumper wire for about 8 seconds.

Does the pump motor run with an increasingly loud, raspy sound?

NO

Pump runs with a constant soft sound:
Bleed air from anti-lock brake system using the procedure on page 19-114 and check the pump sound again.

YES

Check the accumulator fluid quantity by bleeding the high pressure line with the Bleeder T-wrench.

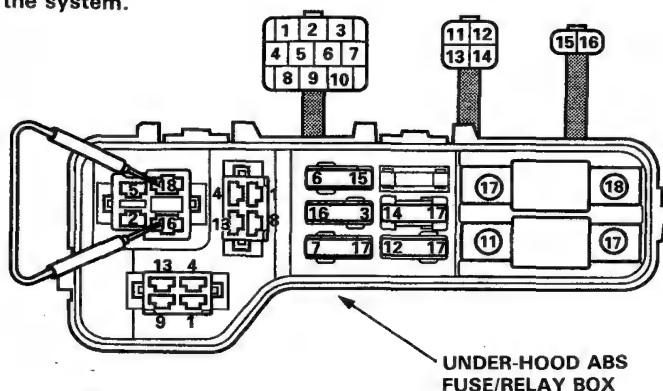
Is there 40–70 cc?

NO

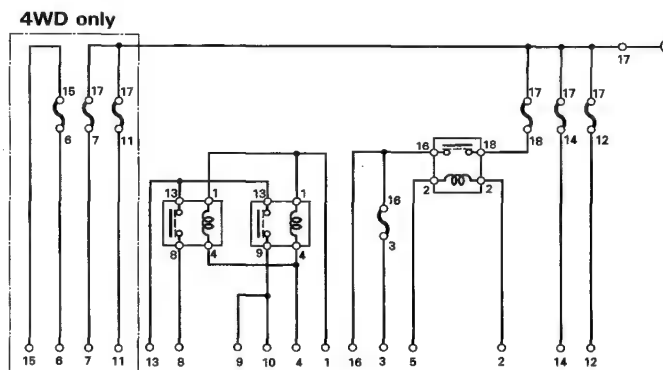
(To page 19-72)

YES

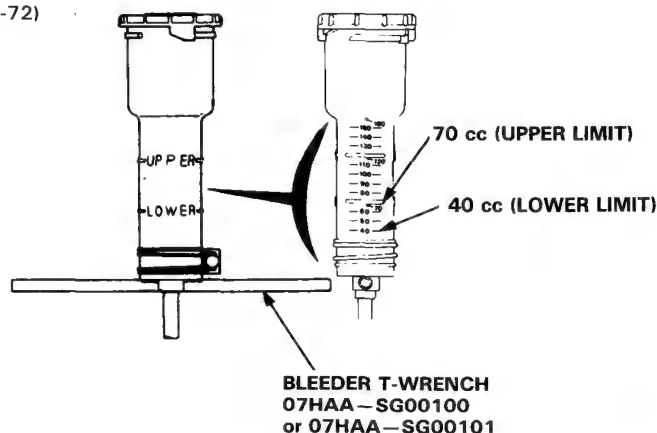
(To page 19-72)



UNDER-HOOD ABS FUSE/RELAY BOX



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM



BLEEDER T-WRENCH
07HAA—SG00100
or 07HAA—SG00101

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-71)

(From page 19-71)

Connect the No. 16 and No. 18 terminals using a jumper wire for about 10 seconds.

Check if there is any change in the fluid level in the reservoir tank.

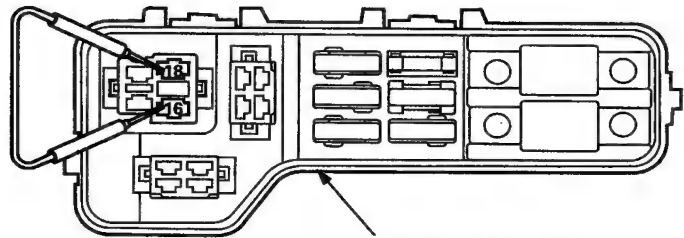
Is there any change?

NO

Faulty pump motor (Relief valve is defective and open).

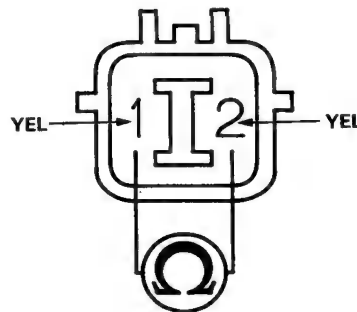
YES

Faulty solenoid (leakage).



UNDER-HOOD ABS
FUSE/RELAY BOX

SWITCH-SIDE CONNECTOR



View from terminal side.

Connect the No. 16 and No. 18 terminals using a jumper wire for about 10 seconds.

Disconnect the pressure switch 2-P connector and check the continuity between the No. 1 (YEL) and No. 2 (YEL) terminals.

Is there continuity?

NO

Faulty pressure switch.

YES

Vehicle is OK at this time.

Problem Code 1-2: Pump Motor Circuit Problem

CAUTION: Use only the digital multimeter to check the system.

NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The indicator light comes ON after restarting the engine until the malfunction code is erased (by disconnecting the ABS B2 fuse for 3 seconds).

Pre-test steps:

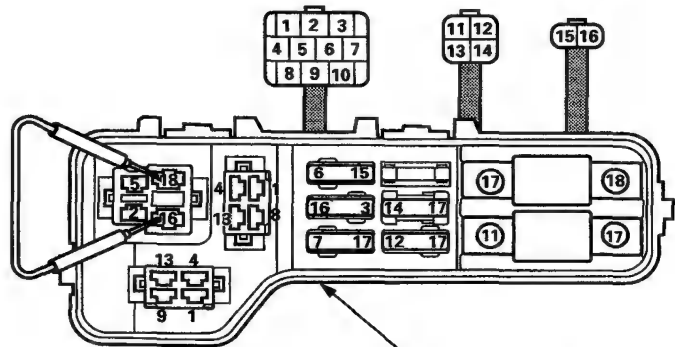
- Check ABS MOTOR (50 A) FUSE
- Check ABS UNIT (7.5 A) FUSE
- Check for loose under-hood ABS fuse/relay box connectors.

Remove and check the pump motor relay (page 19-122).

Does it work properly? NO → Faulty pump motor relay.

YES

Connect the No. 16 and No. 18 terminals using a jumper wire.



UNDER-HOOD ABS FUSE/RELAY BOX

Does the pump motor run? NO → (To page 19-75)

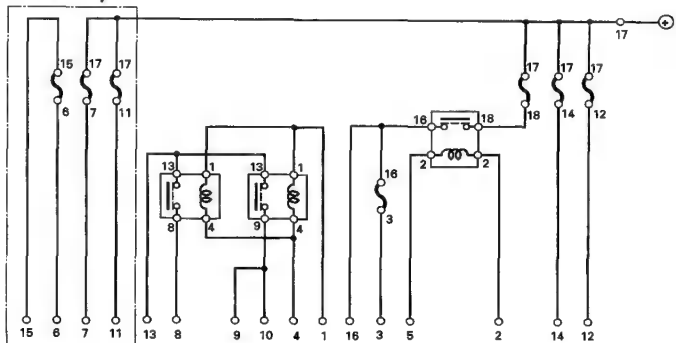
YES

Disconnect the jumper wire.

Disconnect the 2-P connector from the pump motor.

(To page 19-74)

4WD only



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-73)

Remove the ABS UNIT (7.5 A) fuse from under-hood ABS fuse/relay box.

Turn the ignition switch ON.

Check for voltage between the under-hood ABS fuse/relay box ABS UNIT fuse No. 3 terminal and body ground.

Is there battery voltage?

NO

Repair open in BRN/YEL wire between the ABS UNIT fuse and control unit.

YES

Reinstall the fuse in the under-hood ABS fuse/relay box.

Check for voltage between the pump motor relay No. 16 terminal (+) and body ground (-).

Is there battery voltage?

NO

Faulty under-hood ABS fuse/relay box.

YES

Check for voltage between the No. 2 terminal and body ground.

Is there battery voltage?

NO

Repair open in BLK/YEL wire between the No. 13 RR DEF RLY/HEATER MOTOR RLY/COOLING FAN MOTOR RLY (7.5 A) fuse and pump motor relay.

YES

Reinstall the pump motor relay.

Disconnect the 18-P connector from the control unit.

Check for voltage between the control unit connector YEL/RED (PMR) terminal and body ground.

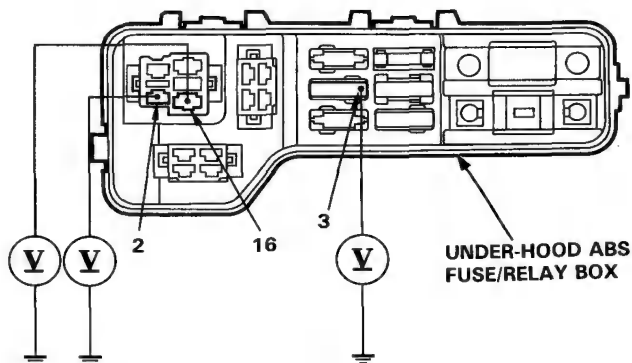
Is there battery voltage?

NO

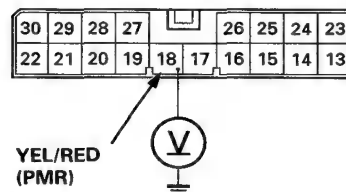
Repair open in YEL/RED wire between the pump motor relay and control unit.

YES

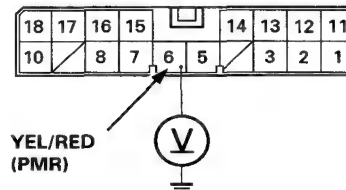
Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.



18-P CONNECTOR (2WD)



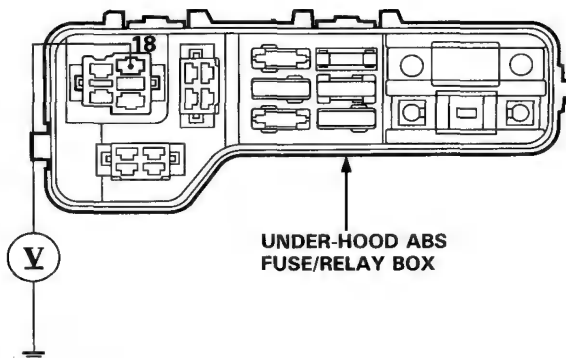
18-P CONNECTOR (4WD)



View from control unit terminal side.

(From page 19-73)

Check for voltage between the No. 18 terminal (+) and body ground (-).



UNDER-HOOD ABS FUSE/RELAY BOX

Is there battery voltage?

NO

Faulty under-hood ABS fuse/relay box.

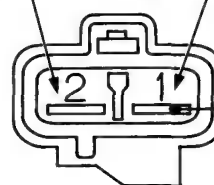
YES

Disconnect the 2-P connector from the pump motor.

Check for voltage between the No. 1 (WHT/BLU) terminal (+) and body ground (-).

HARNESS-SIDE CONNECTOR

BLK (GROUND) WHT/BLU (MOTOR RELAY)



View from terminal side.

Is there battery voltage?

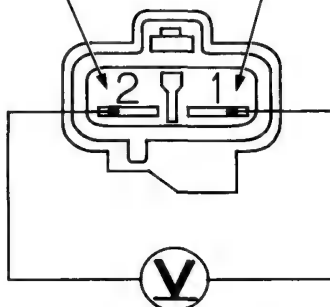
NO

Repair open in WHT/BLU wire between the motor relay and pump motor.

YES

Check for voltage between the No. 1 (WHT/BLU) terminal (+) and No. 2 (BLK) terminal (-).

HARNESS-SIDE CONNECTOR
BLK (GROUND) WHT/BLU (MOTOR RELAY)



View from terminal side.

Is there battery voltage?

NO

Repair open in BLK wire between the pump motor and ground or poor ground (G202).

YES

Faulty pump motor.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Problem Code 1-3: High Pressure Leakage

CAUTION: Use only the digital multimeter to check the system.

Pre-test steps:

- Check reservoir fluid level, and if necessary, fill to the MAX level.
- Check for fluid leaks from the functional parts and replace the faulty parts if there is a leak.

Functional parts:

- Modulator
- Pump assembly
- High pressure hose/pipe

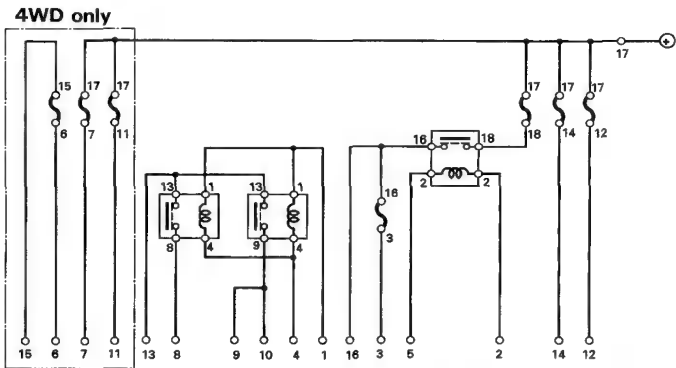
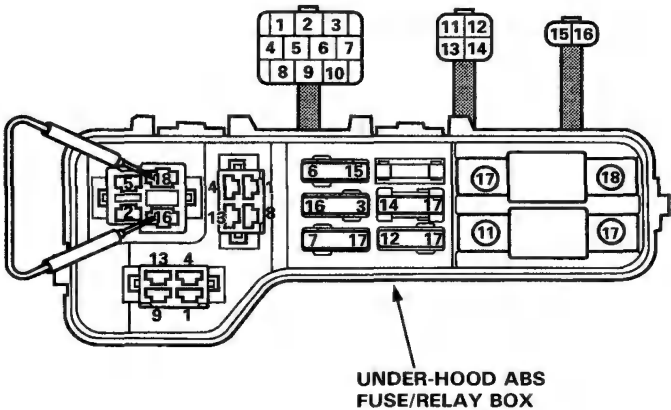
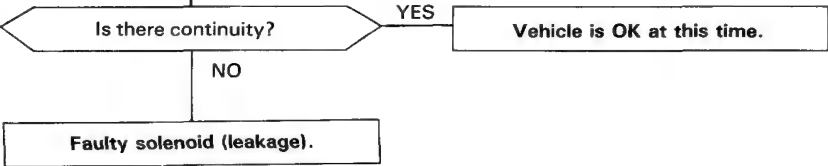
Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (page 19-109).

Remove the pump motor relay.

Connect the No. 15 and No. 18 terminals using a jumper wire for about 10 seconds.

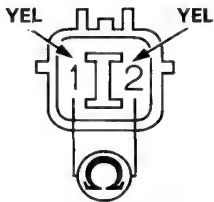
Disconnect the 2-P connector from the pressure switch.

After 30 minutes, check for continuity between the No. 1 (YEL) and No. 2 (YEL) terminals on the switch side of connector.



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

SWITCH-SIDE CONNECTOR



View from terminal side.

Problem Code 1-4: Pressure Switch Circuit

CAUTION: Use only the digital multimeter to check the system.

Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (page 19-109).

Disconnect the 2-P connector from the pressure switch.

Check the continuity of pressure switch between the No. 1 (YEL) and No. 2 (YEL) terminals.

Is there continuity?

YES

Faulty pressure switch (closed).

NO

Check for continuity between the No. 1 (YEL) terminal and body ground on the harness-side connector.

Is there continuity?

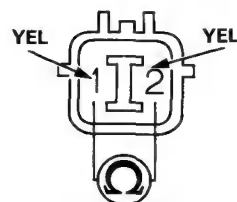
YES

Repair short in YEL wire between the control unit and pressure switch.

NO

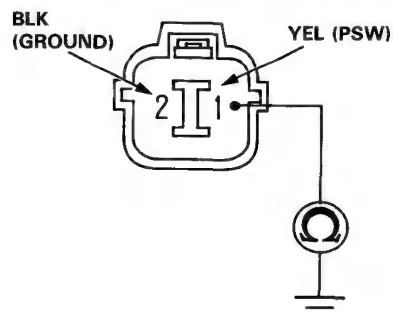
Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

SWITCH-SIDE CONNECTOR



View from terminal side.

HARNESS-SIDE CONNECTOR



View from terminal side.

(cont'd)

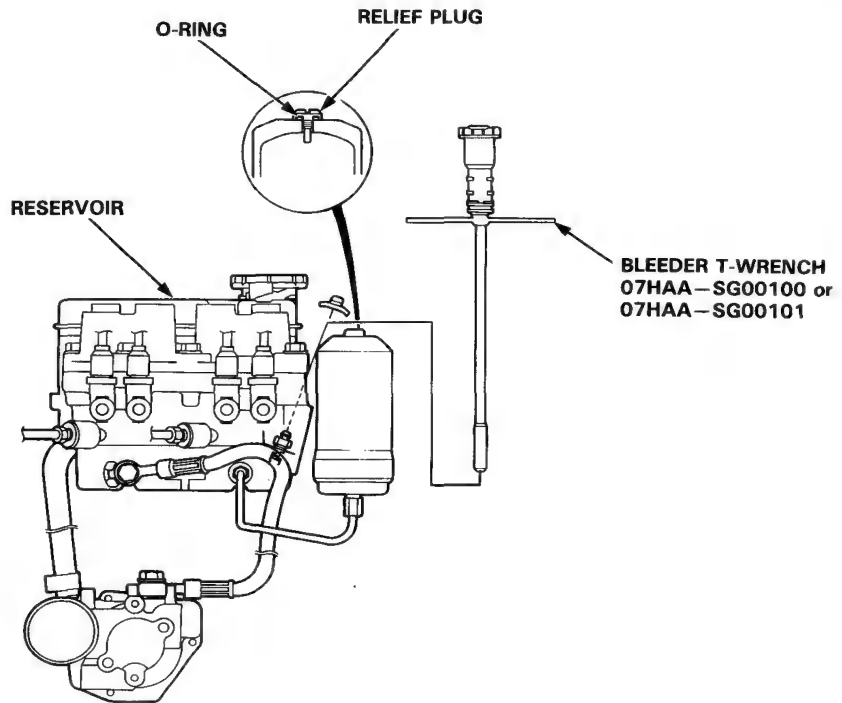
Troubleshooting

Flowcharts (cont'd)

Problem Code 1-8: Accumulator Gas Leakage

Check the following items:

- The relief plug is loose.
- The relief plug O-ring is out of place.
- Bleed the high pressure line with the Bleeder T-wrench. Operate the pump motor for 10 seconds and bleed the high pressure line again with the Bleeder T-wrench. If no fluid or more than 70 cc of fluid comes out, it is likely that the gas has leaked out.



Problem Code 2-1: Parking Brake Switch Related Problem

If the parking brake has been released, the following items are possible causes. If they are OK, check the control unit connectors for good connection. If not loose or disconnected, substitute a known-good control unit and recheck.

NOTE: Before Troubleshooting Problem Code 2-1, remove the ABS B2 (15 A) fuse for 3 seconds to clear the control unit's memory, then test drive the car.

If the anti-lock brake system indicator light stays off, the probability is that the car was driven with the parking brake applied.

- The parking brake is applied for more than 30 seconds while driving.
- The brake fluid level in the master cylinder is too low.
- GRN/RED wire is shorted between the **BRAKE** indicator light and parking brake switch.
- GRN/RED wire is shorted between the **BRAKE** indicator light and brake fluid level switch.
- The **BRAKE** indicator light is blown.
- GRN/RED has an open between the **BRAKE** indicator light and the control unit.

Problem Code 4-1 to 4-8: Speed Sensor

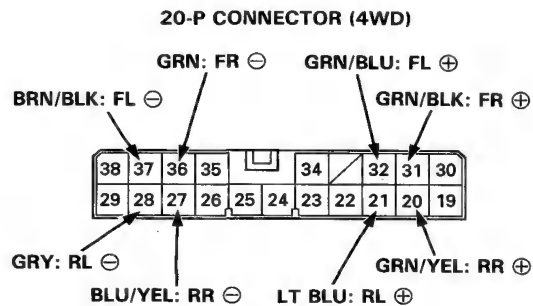
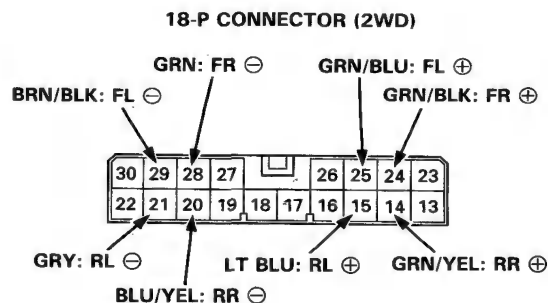
CAUTION: Use only the digital multimeter to check the system.

NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The indicator light may come ON after restarting the engine until the malfunction code is erased (by disconnecting the ABS B2 fuse for 3 seconds).

Disconnect the 18-P (4WD: 20-P) connector from the control unit.

Check each sensor for continuity between the positive and negative:

- GRN/BLK: Front Right Positive
- GRN: Front Right Negative
- GRN/BLU: Front Left Positive
- BRN/BLK: Front Left Negative
- GRN/YEL: Rear Right Positive
- BLU/YEL: Rear Right Negative
- LT BLU: Rear Left Positive
- GRY: Rear Left Negative



View from control unit terminal side.

Is there following resistance?
2WD Front: 600—900 Ω
Rear : 700—1100 Ω
4WD Front: 600—900 Ω
Rear : 1000—1400 Ω

YES

Check for continuity to ground of wire and sensor.

Is there continuity?

YES

Repair short in sensor wire or faulty speed sensor.

NO

Check for loose control unit connectors. Check that the sensor is installed properly. If necessary, substitute a known-good control unit and recheck.

NO

(To page 19-80)

(cont'd)

Troubleshooting

Flowcharts (cont'd)

° (From page 19-79)

Disconnect the 2-P connector of the speed sensor.

Check for resistance between the sensor terminals.

Is there following resistance?
2WD Front: 600–900 Ω
Rear : 700–1100 Ω
4WD Front: 600–900 Ω
Rear : 1000–1400 Ω

NO

Faulty speed sensor.

YES

Reconnect the 18-P connector to the control unit.

Check each wire for continuity between the speed sensor harness-side terminals and body ground.

Is there continuity?

NO

Repair open in wire harness.

YES

Check for loose speed sensor connectors. If necessary, substitute a known-good control unit and recheck.

SENSOR-SIDE CONNECTOR

FRONT



REAR



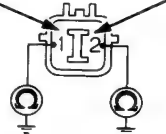
View from terminal side.

HARNESS-SIDE CONNECTOR

FRONT LEFT

BRN/BLK: \ominus

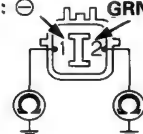
GRN/BLU: \oplus



FRONT RIGHT

GRN: \ominus

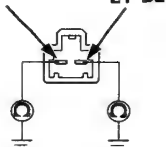
GRN/BLK: \oplus



REAR LEFT

GRY: \ominus

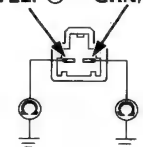
LT BLU: \oplus



REAR RIGHT

BLU/YEL: \ominus

GRN/YEL: \oplus



View from terminal side.

Positive: 3.3 k Ω \pm 15% is OK.
Negative: Less than 1 Ω is OK.

Problem Code 5 to 5-8: Speed Sensor(s)

CAUTION: Use only the digital multimeter to check the system.

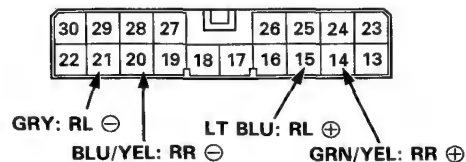
NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The indicator light may come ON after restarting the engine until the malfunction code is erased (by disconnecting the ABS B2 fuse for 3 seconds).

Disconnect the 18-P (4WD: 20-P) connector from the control unit.

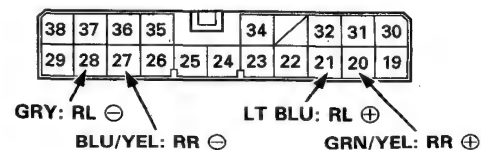
Check each sensor for continuity between the positive and negative:

- GRN/YEL: Resr Right Positive
- BLU/YEL: Rear Right Negative
- LT BLU: Rear Left Positive
- GRY: Rear Left Negative

18-P CONNECTOR (2WD)



20-P CONNECTOR (4WD)



View from control unit terminal side.

Is there
2WD: 700–1100 Ω,
4WD: 1000–1400 Ω?

NO

Check for continuity to ground.

Is there continuity?

YES

Repair short in sensor wire or faulty speed sensor.

NO

Reconnect the 18-P connector to the control unit.

Connect the ALB checker to the inspection connector.

Check for ALB function MODE 2 and 3.

Does it work properly?

NO

Faulty modulator.

YES

Check for rear brake drag. If OK, substitute a known-good control unit and recheck.

(To page 19-82)

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-81)

Disconnect the wire harness from rear speed sensor.

Check for resistance between the sensor terminals.

Is there
2WD: 700—1100 Ω ,
4WD: 1100—1400 Ω ?

NO

Faulty speed sensor.

YES

Reconnect the 18-P connector to the control unit.

Check each wire for continuity between the speed sensor harness-side terminals and body ground.

Is there continuity?

NO

Repair open in wire harness.

YES

Check for loose speed sensor connectors. If necessary, substitute a known-good control unit and recheck.

SENSOR-SIDE CONNECTOR

REAR



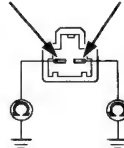
View from terminal side.

HARNESS-SIDE CONNECTOR

REAR LEFT

GRY: \ominus

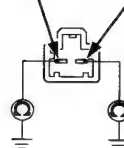
LT BLU: \oplus



REAR RIGHT

BLU/YEL: \ominus

GRN/YEL: \oplus



View from terminal side.

Positive: 3.3 k Ω \pm 15% is OK.
Negative: Less than 1 Ω is OK.

Problem Code 6-1: Front Fail-Safe Relay Circuit

CAUTION: Use only the digital multimeter to check the system.

Pre-test steps:

- Check ABS B1 (20 A) FUSE
- Check for loose under-hood ABS fuse/relay box connectors.

Remove the front fail-safe relay from the under-hood ABS fuse/relay box.

Check relay function (page 19-122).

Does it work properly?

NO

Faulty front fail-safe relay.

YES

Disconnect the 10-P connector from the solenoid.

Turn the ignition switch ON.

Check for voltage between the fail-safe relay No. 1 (BLK/YEL) terminal and body ground.

Is there battery voltage?

NO

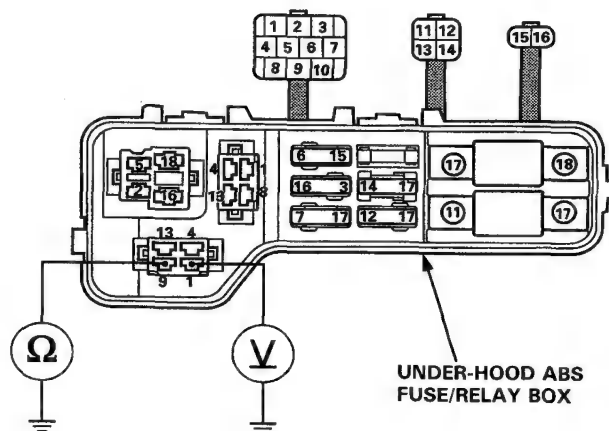
Repair open in BLK/YEL wire between the fuse and front fail-safe relay.

YES

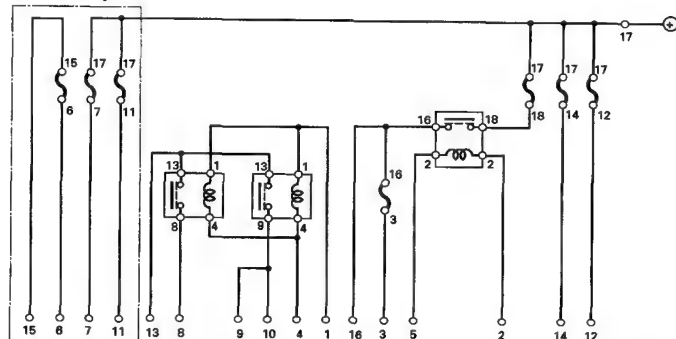
Turn the ignition switch OFF.

Check for continuity between the fail-safe relay No. 9, 10 (BRN/BLK) terminal and body ground.

(To page 19-84)



4WD only



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-83)

Is there continuity?

YES

Repair short in BRN/BLK wire between the solenoid and front fail-safe relay.

NO

Reinstall the front fail-safe relay.

Check each wire for continuity between the solenoid terminals and body ground

No. 6 (BRN/BLU): Front Right
No. 4 (BRN/BLK): Front Left

Is there continuity?

YES

Faulty solenoid (short).

NO

Disconnect the 18-P and 12-P connectors (4WD: 18-P connector) from the control unit.

Check each wire for continuity between the control unit and body ground.

RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

Is there continuity?

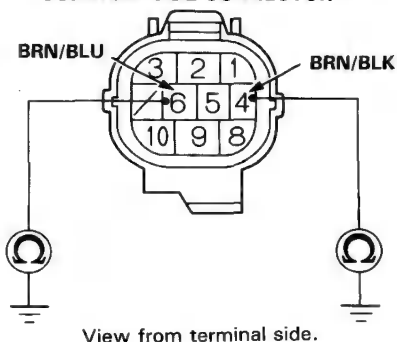
YES

Repair short in wire between the solenoid and control unit:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

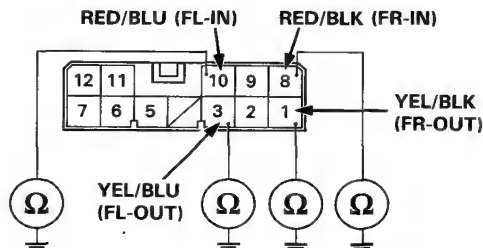
NO

(To page 19-85)

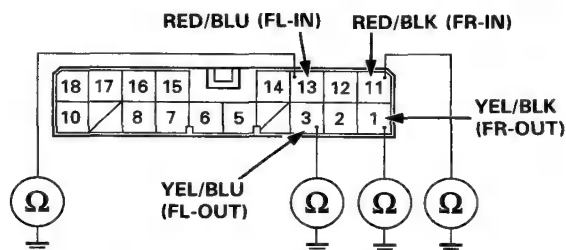
SOLENOID-SIDE CONNECTOR



12-P CONNECTOR (2WD)



18-P CONNECTOR (4WD)



View from control unit terminal side.

(From page 19-84)

Remove the rear fail-safe relay.

Check for continuity between the YEL/GRN (FSR) terminal and body ground.

Is there continuity?

NO

Repair short in YEL/GRN wire between the control unit and front fail-safe relay.

YES

Turn the ignition switch ON.

Check for voltage between the control unit connector YEL/GRN (FSR) terminal and body ground.

Is there battery voltage?

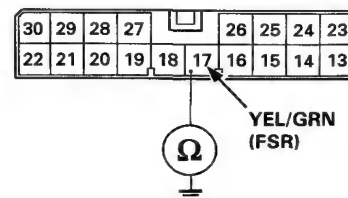
YES

Repair open in YEL/GRN wire between the front fail-safe relay and control unit.

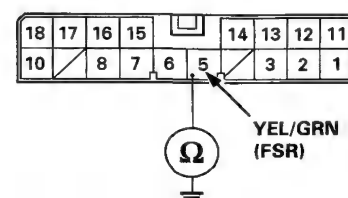
NO

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

18-P CONNECTOR (2WD)

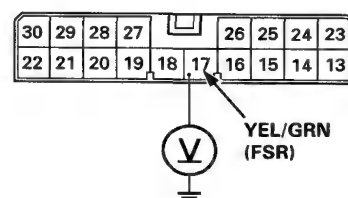


18-P CONNECTOR (4WD)

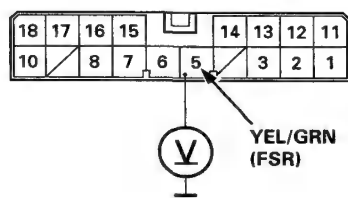


View from control unit terminal side.

18-P CONNECTOR (2WD)



18-P CONNECTOR (4WD)



View from control unit terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Problem Code 6-4: Rear Fail-Safe Relay Circuit

CAUTION: Use only digital multimeter to check the system.

Pre-test step:

- Check for loose under-hood ABS fuse/relay box connectors.

Remove the rear fail-safe relay from the under-hood ABS fuse/relay box.

Check relay function (page 19-122).

Does it work properly?

NO

Faulty rear fail-safe relay.

YES

Disconnect the 10-P connector from the solenoid.

Turn the ignition switch ON.

Check for voltage between the fail-safe relay No. 1 (BLK/YEL) terminal and body ground.

Is there battery voltage?

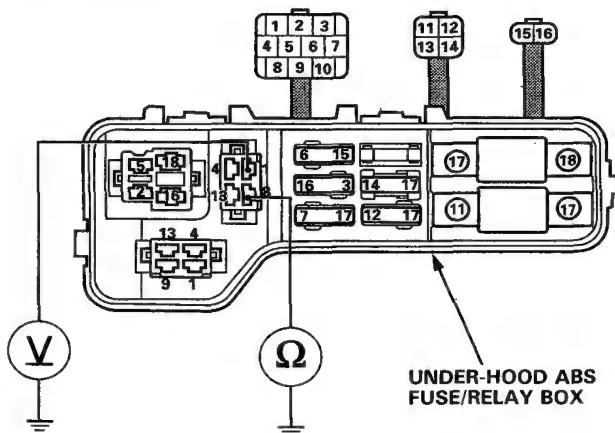
NO

Repair open in BLK/YEL wire between the fuse and front fail-safe relay.

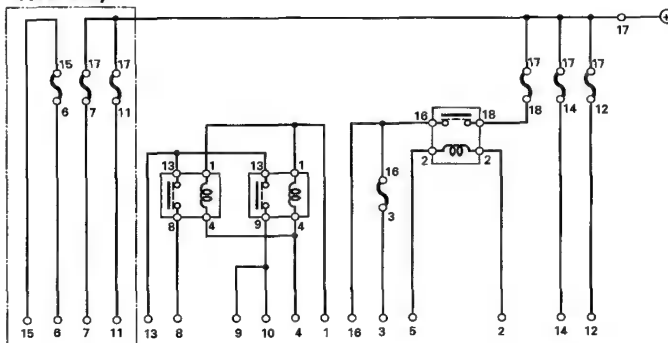
YES

Turn the ignition switch OFF.

Check for continuity between the fail-safe relay No. 8 (BLU/BLK) terminal and body ground.



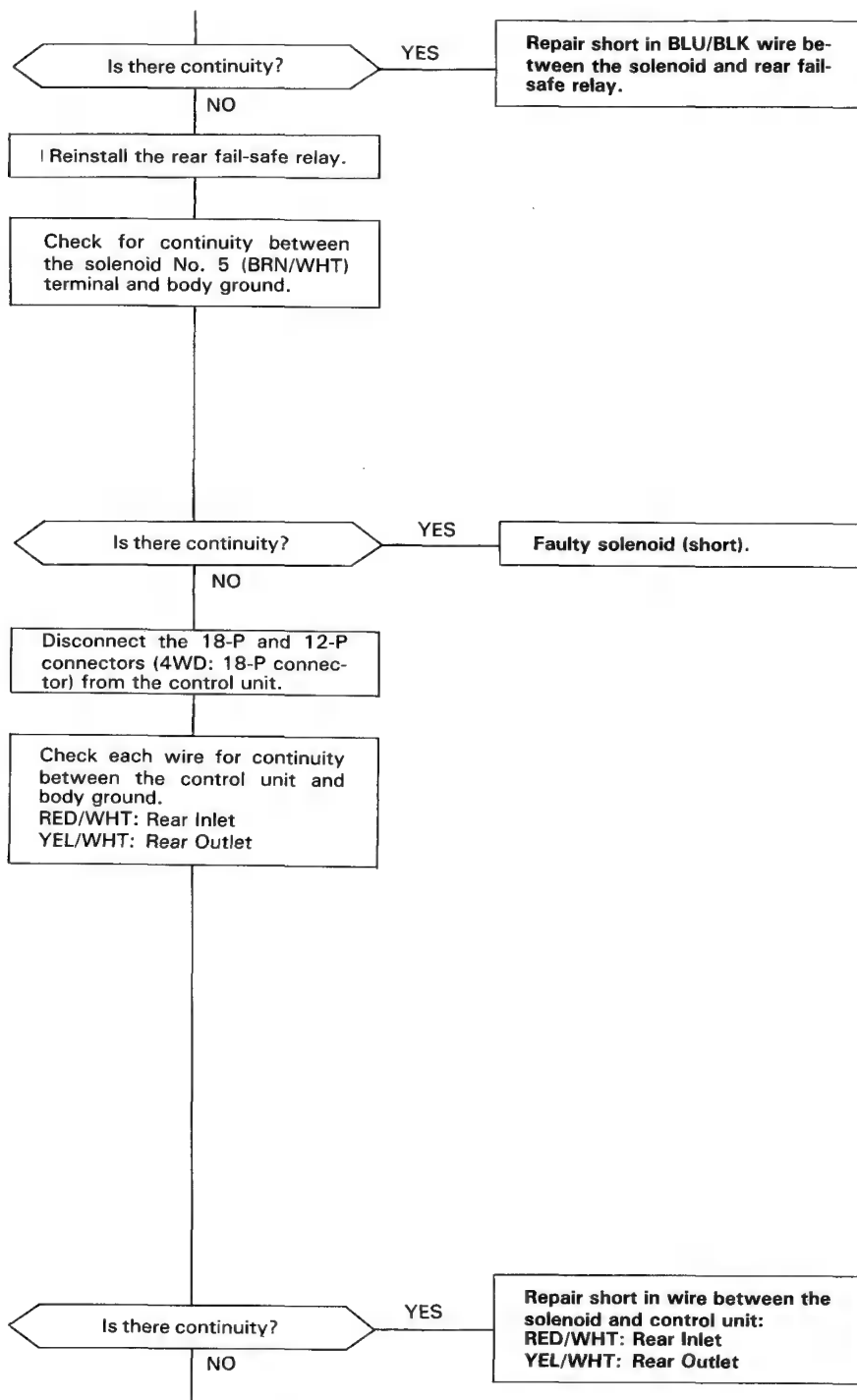
4WD only



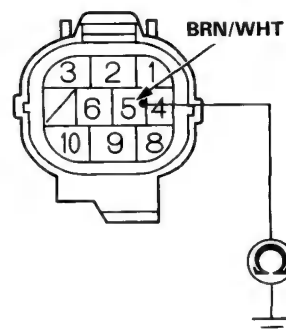
UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

(To page 19-87)

(From page 19-86)



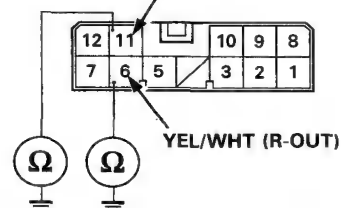
SOLENOID-SIDE CONNECTOR



View from terminal side.

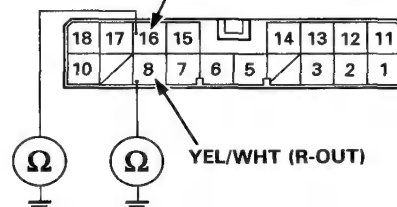
12-P CONNECTOR (2WD)

RED/WHT (R-IN)



18-P CONNECTOR (4WD)

RED/WHT (R-IN)



View from control unit terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-87)

Remove the front fail-safe relay.

Check for continuity between the YEL/GRN (FSR) terminal and body ground.

Is there continuity?

YES

Repair short in YEL/GRN wire between the control unit and rear fail-safe relay.

NO

Turn the ignition switch ON.

Check for voltage between the control unit connector YEL/GRN (FSR) terminal and body ground.

Is there battery voltage?

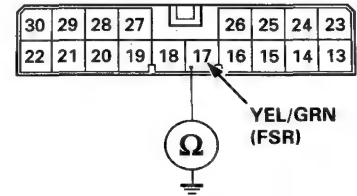
NO

Repair open in YEL/GRN wire between the rear fail-safe relay and control unit.

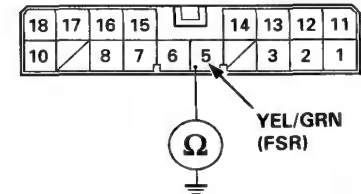
YES

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

18-P CONNECTOR (2WD)

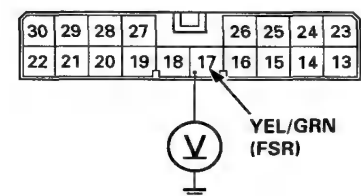


18-P CONNECTOR (4WD)

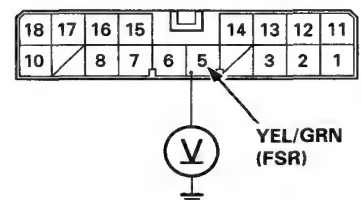


View from control unit terminal side.

18-P CONNECTOR (2WD)



18-P CONNECTOR (4WD)



View from control unit terminal side.

Problem code 7-1 and 7-2 Front Solenoid Related Problem

CAUTION: Use only the digital multimeter to check the system.

Pre-test step:

- Check ABS B1 (20 A) FUSE
- Check for loose under-hood ABS fuse/relay box connectors.

Disconnect the 10-P connector from the solenoids.

Check for resistance between the solenoid terminals:
No. 3 (RED/BLU) and No. 6 (BRN/BLU): Front Right Inlet
No. 1 (RED/BLK) and No. 4 (BRN/BLK): Front Left Inlet

Is there 1—3 Ω?

NO

Faulty solenoid.

YES

Check for resistance between the solenoid terminals:
No. 10 (YEL/BLU) and No. 6 (BRN/BLU): Front Right Outlet
No. 8 (YEL/BLK) and No. 4 (BRN/BLK): Front Left Outlet

Is there 1—3 Ω?

NO

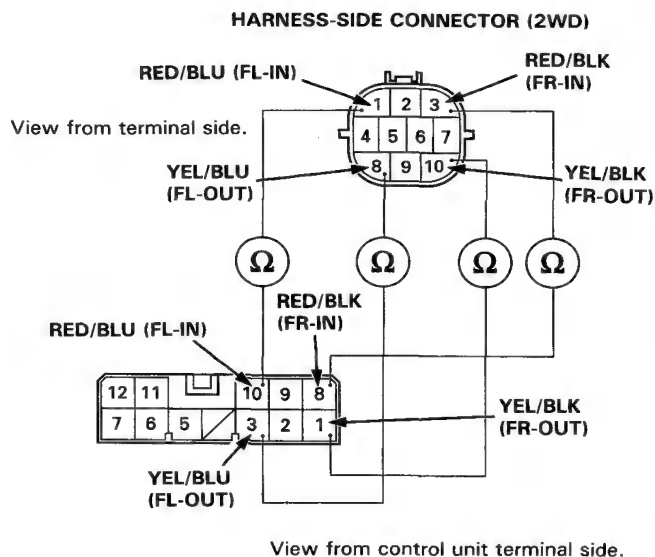
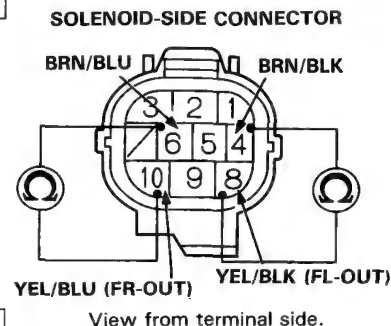
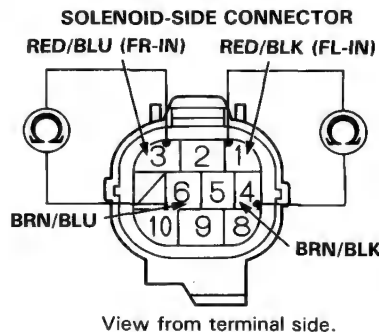
Faulty solenoid.

YES

Disconnect the 12-P (4WD: 18-P) connector from the control unit.

Check each wire for continuity between the control unit and front solenoid:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

(To page 19-90)



(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-89)

Is there continuity?

YES

Check each wire for continuity between the control unit and body ground:

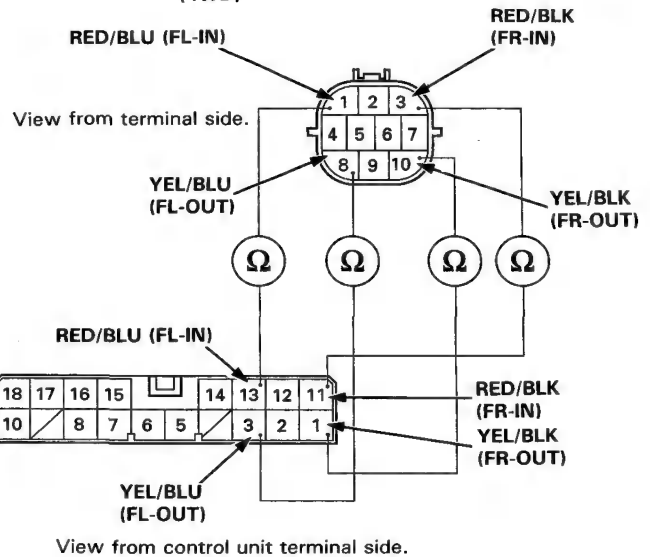
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

(To page 19-91)

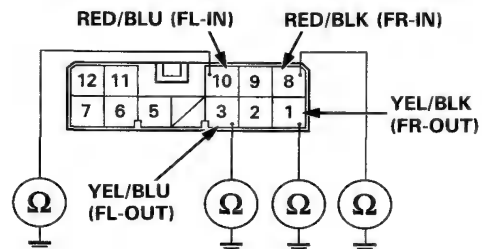
NO

Repair open in wire between the solenoid and control unit:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

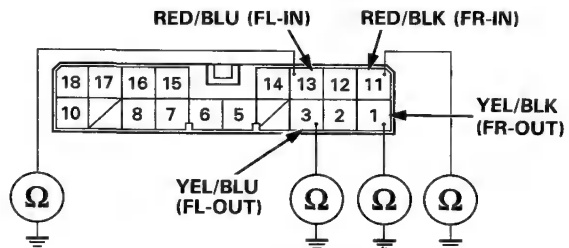
HARNESS-SIDE CONNECTOR (4WD)



12-P CONNECTOR (2WD)

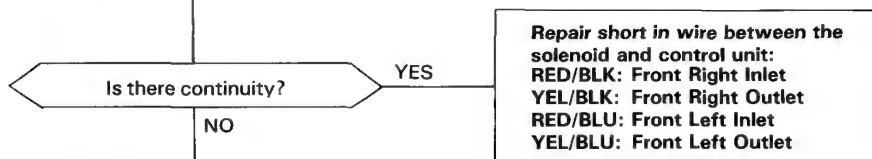


18-P CONNECTOR (4WD)



View from control unit terminal side.

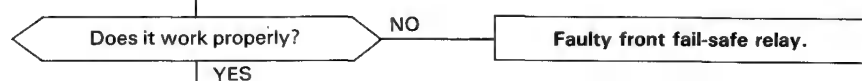
(From page 19-90)



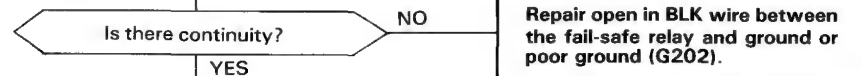
NO

Remove the front fail-safe relay from the under-hood fuse/relay box.

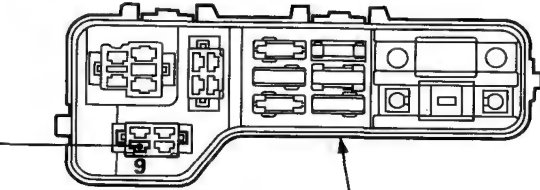
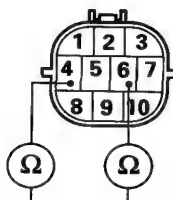
Check for relay function (page 19-122).



Check for continuity between the No. 13 terminal and body ground.

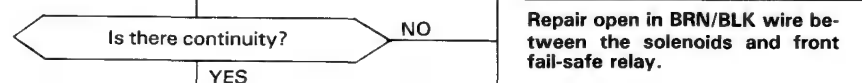


Check BRN/BLK wire for continuity between the solenoids and front fail-safe relay.



UNDER-HOOD ABS FUSE/RELAY BOX

UNDER-HOOD ABS FUSE/RELAY BOX



Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Problem Code 7-4: Rear Solenoid Problem

CAUTION: Use only the digital multimeter to check the system.

Pre-test step:

- Check for loose under-hood ABS fuse/relay box connectors.

Disconnect the 10-P connector from the solenoids.

Check for resistance between the solenoid terminals:
No. 2 (RED/WHT) and No. 5 (BRN/WHT): Rear Inlet
No. 9 (YEL/WHT) and No. 5 (BRN/WHT): Rear Outlet

Is there 1–3 Ω ?

NO

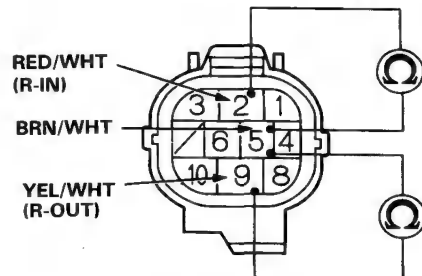
Faulty solenoid.

YES

Disconnect the 12-P (4WD: 18-P) connector from control unit.

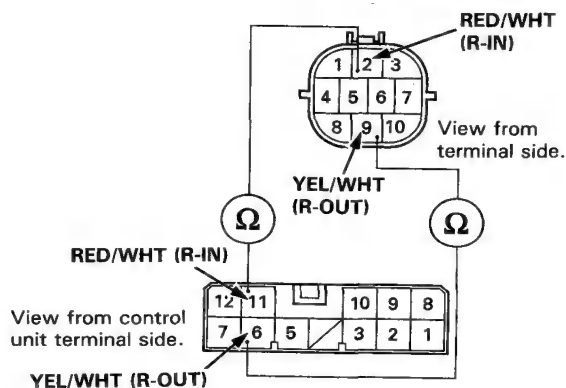
Check each wire for continuity between the control unit and rear solenoid:
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

SOLENOID-SIDE CONNECTOR



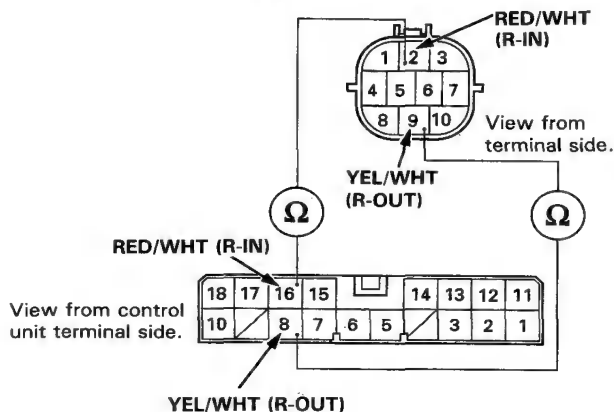
View from terminal side.

HARNESS-SIDE CONNECTOR (2WD)



View from control unit terminal side.

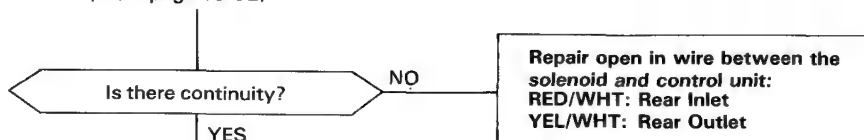
HARNESS-SIDE CONNECTOR (4WD)



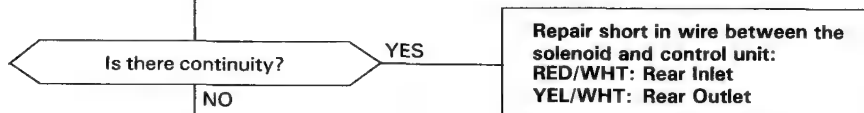
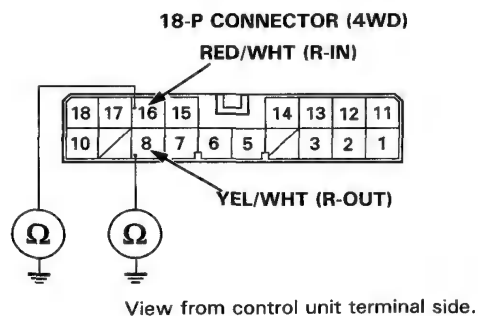
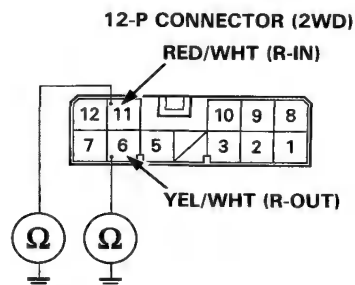
View from control unit terminal side.

(To page 19-93)

(From page 19-92)

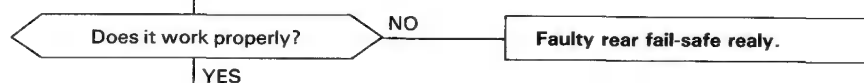


Check each wire for continuity between the control unit and body ground:
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet



Remove the rear fail-safe relay from the under-hood fuse/relay box.

Check for relay function (page 19-122).



(To page 19-94)

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-93)

Check for continuity between the No. 13 (BLK) terminal and body ground.

Is there continuity?

NO

Repair open in BLK wire between the fail-safe relay and ground or poor ground (G202).

YES

Check BLU/BLK wire for continuity between the solenoid and rear fail-safe relay.

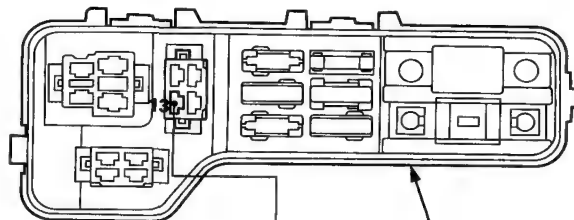
Is there continuity?

NO

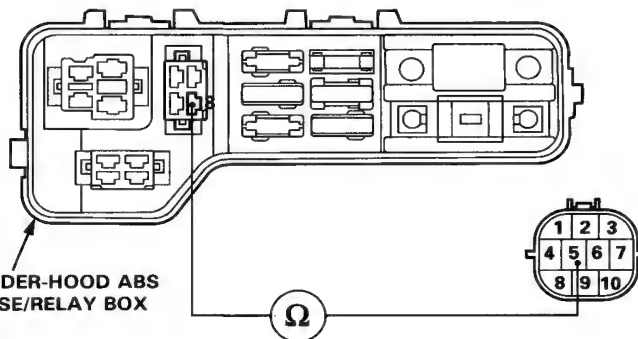
Repair open in BLU/BLK wire between the solenoid and rear fail-safe relay.

YES

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.



UNDER-HOOD ABS FUSE/RELAY BOX



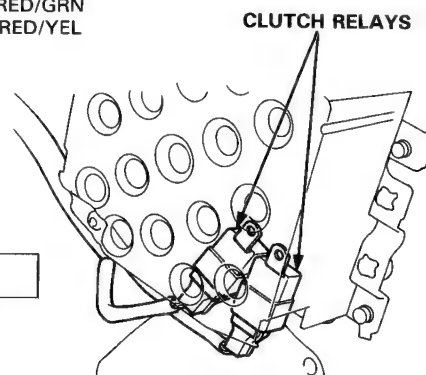
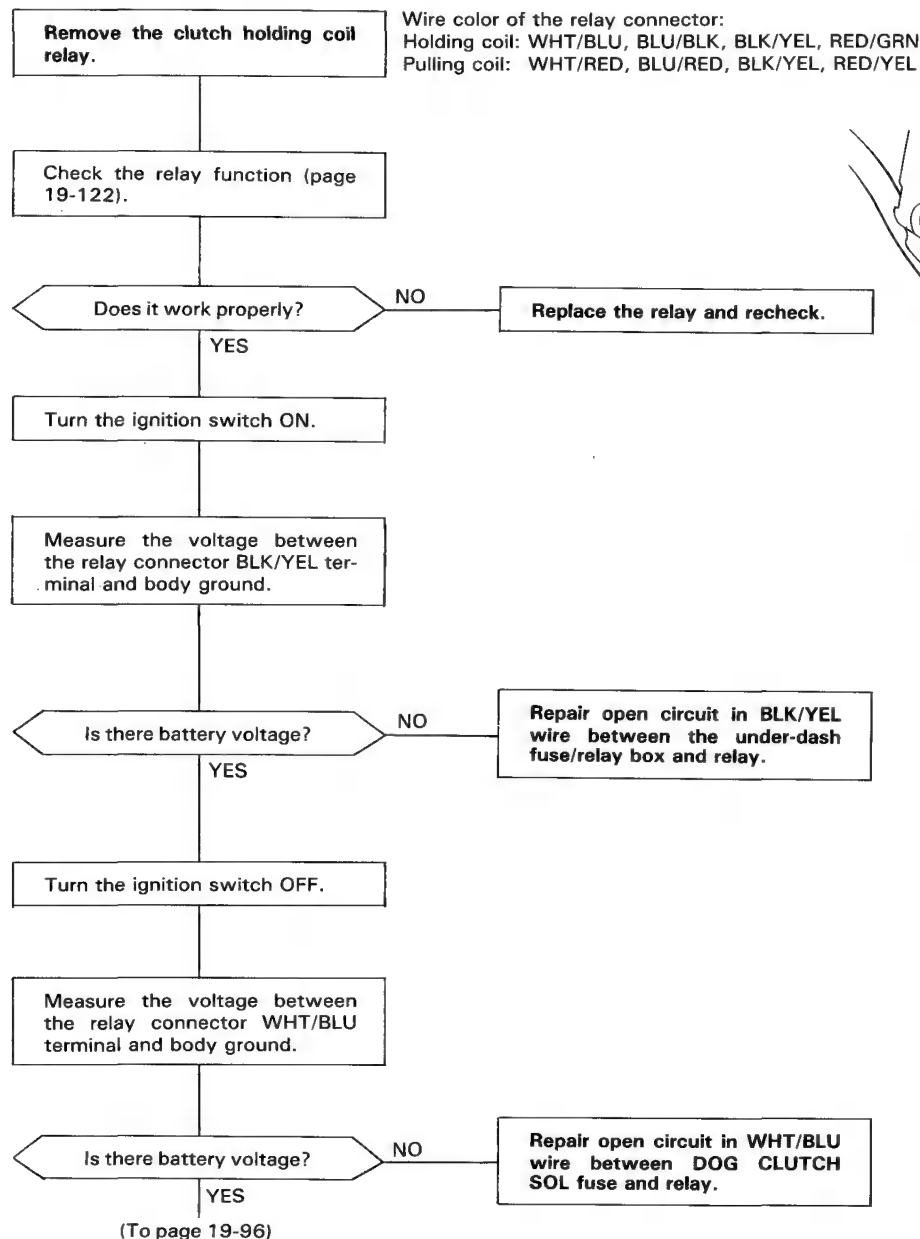
UNDER-HOOD ABS FUSE/RELAY BOX

Problem Code 8-1: Rear Differential Clutch Relay and Stroke Switch Circuits

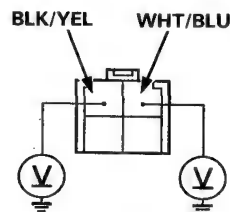
CAUTION: Use only digital multimeter to check the system.

Pre-test steps:

- Check DOG CLUTCH SOL (7.5 A) fuse.
- Check ABS CLUTCH MAIN (40 A) fuse.
- Check for loose under-hood ABS fuse/relay box connectors.



HARNESS SIDE CONNECTOR



View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-95)

Short the WHT/BLU and BLU/BLK terminals of the relay connector with a jumper wire.

Use a wire of which diameter is 3 mm (0.12 in) or more.

Disconnect the connectors from the control unit.

Measure the voltage between the control unit connector BLU/BLK (SLM 1) terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLU/BLK wire between the relay and control unit.

YES

Remove the jumper wire.

Install the clutch holding coil relay.

Turn the ignition switch ON.

Measure the voltage between the control unit connector RED/GRN (SOL 1) terminal and body ground.

Is there battery voltage?

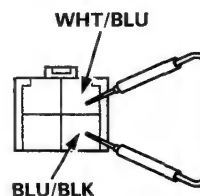
NO

Repair open or short circuit in RED/GRN wire between the clutch holding coil relay and control unit.

YES

(To page 19-97)

HARNESS SIDE CONNECTOR



View from terminal side.

20-P CONNECTOR

38	37	36	35		34	32	31	30
29	28	27	26	25	24	23	22	21
20	19							

BLU/BLK (SLM 1)



View from control unit terminal side.

18-P CONNECTOR

RED/GRN (SOL 1)

18	17	16	15		14	13	12	11
10	9	8	7	6	5	4	3	2
1								



View from control unit terminal side.

(From page 19-96)

Remove the clutch pulling coil relay.

Wire color of the relay connector:
Holding coil: WHT/BLU, BLU/BLK, BLK/YEL, RED/GRN
Pulling coil: WHT/RED, BLU/RED, BLK/YEL, RED/YEL

Check the relay function (page 19-122).

Does it work properly?

NO

Replace the relay and recheck.

YES

Turn the ignition switch ON.

Measure the voltage between the relay connector BLK/YEL terminal and body ground.

Is there battery voltage?

NO

Repair open or short circuit in BLK/YEL wire between the under-dash fuse/relay box and relay.

YES

Turn the ignition switch OFF.

Measure the voltage between the relay connector WHT/RED terminal and body ground.

Is there battery voltage?

NO

Open or short circuit in WHT/RED wire between the ABS CLUTCH MAIN fuse and relay.

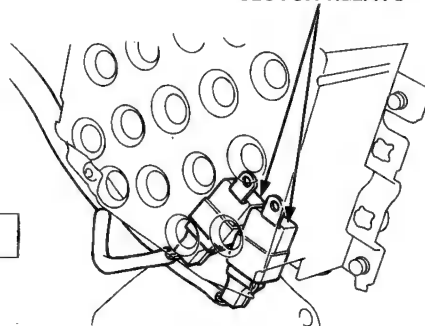
YES

Short the WHT/RED and BLU/RED terminals of the relay connector with a jumper wire.

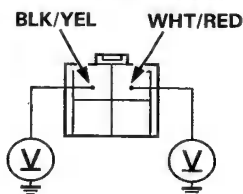
Use a wire of which diameter is 3 mm (0.12 in) or more.

(To page 19-98)

CLUTCH RELAYS

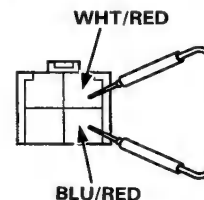


HARNESS SIDE CONNECTOR



View from terminal side.

HARNESS SIDE CONNECTOR



View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-97)

Disconnect the rear differential solenoid connector.

Measure the voltage between the harness side connector BLU/RED terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLU/RED wire between the relay and solenoid.

YES

Connect the solenoid connector.

Remove the jumper wire.

Install the clutch pulling coil relay.

Disconnect the 18-P connector from the control unit.

Turn the ignition switch ON.

Measure the voltage between the control unit connector RED/YEL (SOL 2) terminal and body ground.

Is there battery voltage?

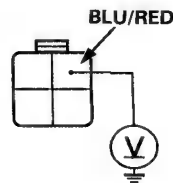
NO

Repair open or short circuit in RED/YEL wire between the relay and control unit.

YES

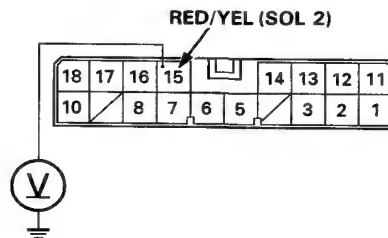
(To page 19-99)

HARNESS SIDE CONNECTOR



View from terminal side.

18-P CONNECTOR



View from control unit terminal side.

(From page 19-98)

Disconnect the stroke switch connector.

Turn the ignition switch ON.

Measure the voltage between the harness side connector BLK/YEL terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLK/YEL wire between the under-dash fuse/relay box and stroke switch.

YES

Turn the ignition switch OFF.

Check for continuity between the harness side connector BLU/GRN terminal and body ground.

Is there continuity?

NO

Repair open circuit in BLU/GRN wire between stroke switch and control unit.

YES

Resistance: 1.2 k Ω

Check the stroke switch (section 15).

Is it OK?

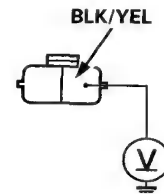
NO

Faulty stroke switch.

YES

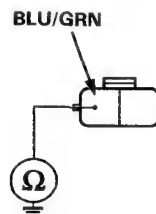
Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

HARNESS SIDE CONNECTOR



View from terminal side.

HARNESS SIDE CONNECTOR



View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Problem Code 8-2: Rear Differential Clutch Holding Coil Relay and Solenoid Holding Coil Circuits

CAUTION: Use only digital multimeter to check the system.

Pre-test steps:

- Check ABS CLUTCH MAIN (40 A) fuse.
- Check CLUTCH MONITOR (7.5 A) fuse.
- Check for loose under-hood ABS fuse/relay box connectors.

Remove the clutch holding coil relay.

Wire color of the relay connector:
Holding coil: WHT/BLU, BLU/BLK, BLK/YEL, RED/GRN
Pulling coil: WHT/RED, BLU/RED, BLK/YEL, RED/YEL

Check the relay function (page 19-122).

Does it work properly?

NO

Replace the relay and recheck.

YES

Measure the voltage between the relay connector WHT/RED terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in WHT/RED wire between the ABS CLUTCH MAIN fuses and relay.

YES

Turn the ignition switch ON.

Measure the voltage between the relay connector BLK/YEL terminal and body ground.

Is there battery voltage?

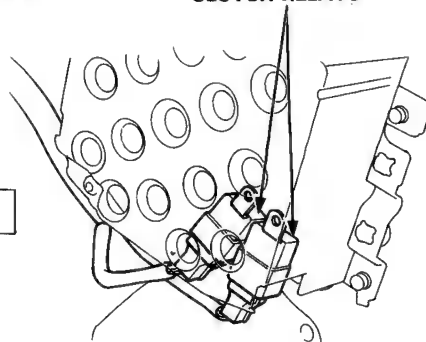
NO

Repair open circuit in BLK/YEL wire between the under-dash fuse/relay box and relay.

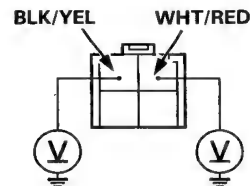
YES

(To page 19-101)

CLUTCH RELAYS



HARNESS SIDE CONNECTOR



View from terminal side.

(From page 19-100)

Remove the CLUTCH MONITOR (7.5 A) fuse from the under-hood ABS fuse/relay box.

Measure the voltage between the CLUTCH MONITOR fuse No. 6 terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLU/ORN wire between CLUTCH MONITOR fuse and control unit.

YES

Install the CLUTCH MONITOR fuse.

Disconnect the rear differential solenoid connector.

Measure the voltage between the harness side connector BLU/RED terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLU/RED wire between the solenoid and CLUTCH MONITOR fuse.

YES

Turn the ignition switch OFF.

Measure the resistance between the solenoid side connector BLU/RED and BLK terminals.

Is there open or short circuit?

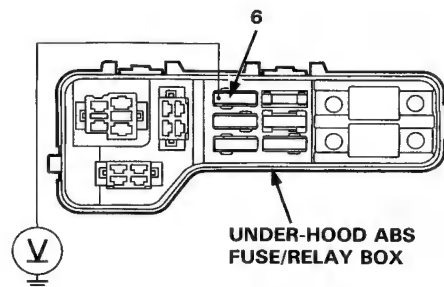
YES

Faulty solenoid.

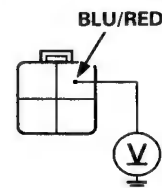
NO

$\infty\Omega$: Open circuit in solenoid
 0Ω : Short circuit in solenoid

(To page 19-102)

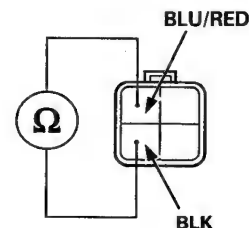


HARNESS SIDE CONNECTOR



View from terminal side.

SOLENOID SIDE CONNECTOR



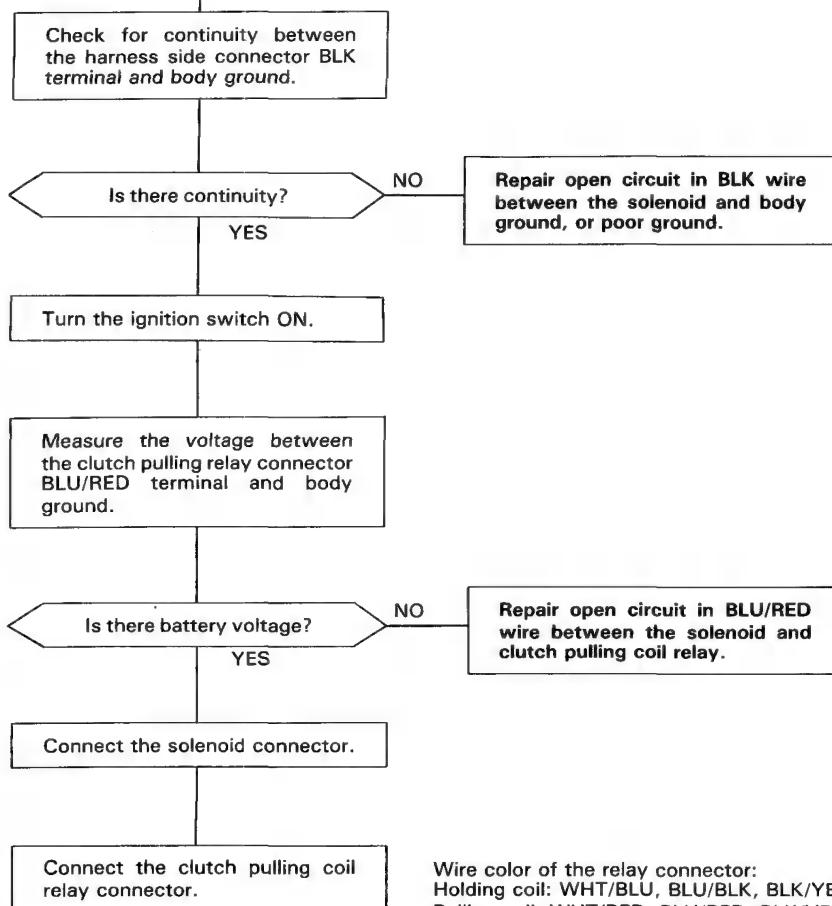
View from terminal side.

(cont'd)

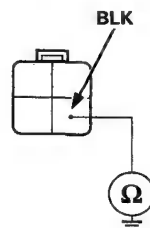
Troubleshooting

Flowcharts (cont'd)

(From page 19-101)

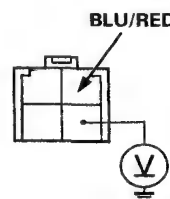


HARNESS SIDE CONNECTOR



View from terminal side.

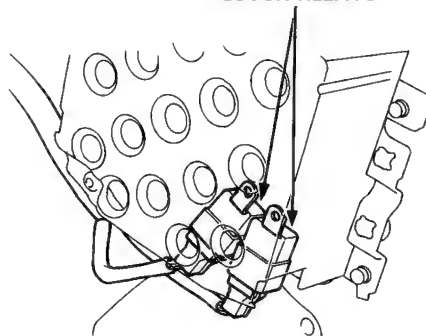
HARNESS SIDE CONNECTOR



View from terminal side.

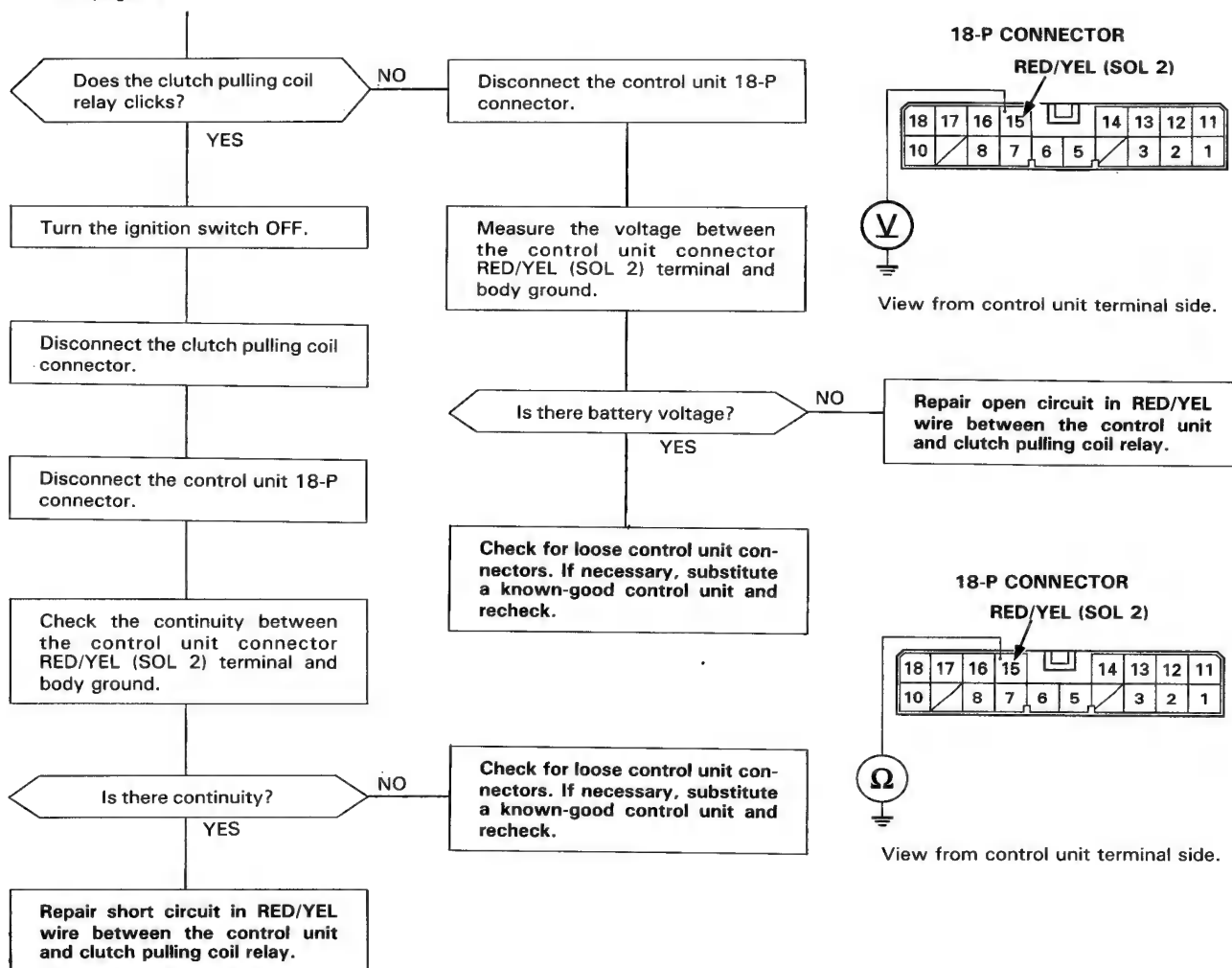
Wire color of the relay connector:
Holding coil: WHT/BLU, BLU/BLK, BLK/YEL, RED/GRN
Pulling coil: WHT/RED, BLU/RED, BLK/YEL, RED/YEL

CLUTCH RELAYS



(To page 19-103)

(From page 19-102)



(cont'd)

Troubleshooting

Flowcharts (cont'd)

Problem Code 8-4: Rear Differential Clutch Pulling Coil Relay and Solenoid Pulling Coil Circuits

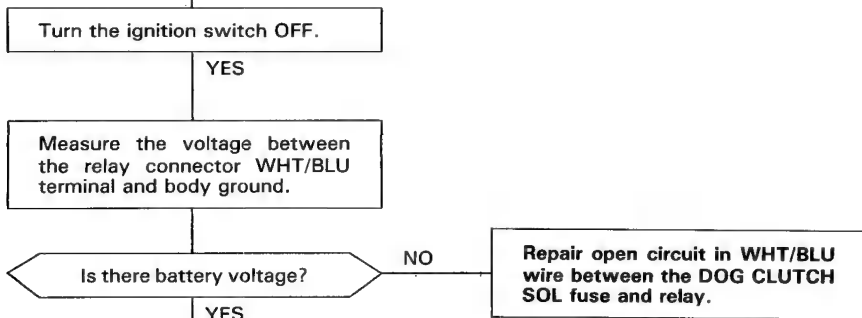
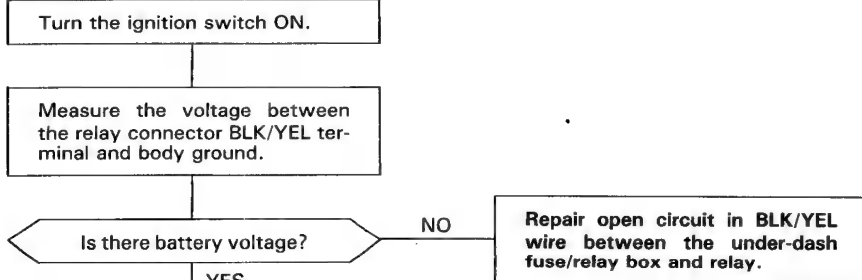
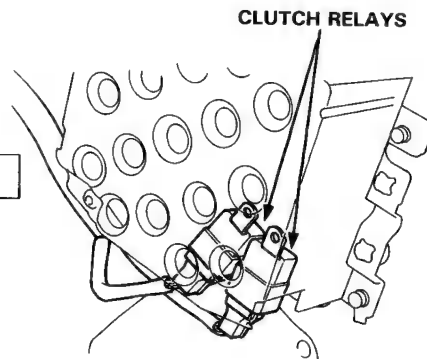
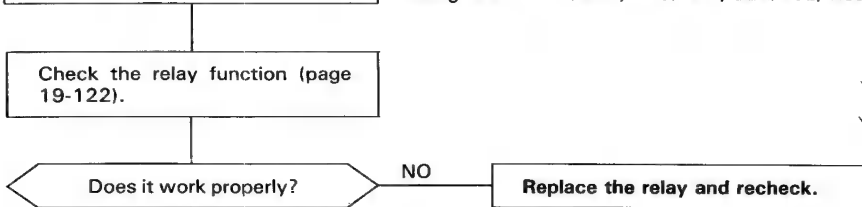
CAUTION: Use only digital multimeter to check the system.

Pre-test steps:

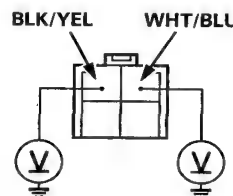
- Check ABS CLUTCH MAIN (40 A) fuse.
- Check DOG CLUTCH SOL (7.5 A) fuse.
- Check for loose under-hood ABS fuse/relay box connectors.

Remove the clutch holding coil relay.

Wire color of the relay connector:
Holding coil: WHT/BLU, BLU/BLK, BLK/YEL, RED/GRN
Pulling coil: WHT/RED, BLU/RED, BLK/YEL, RED/YEL



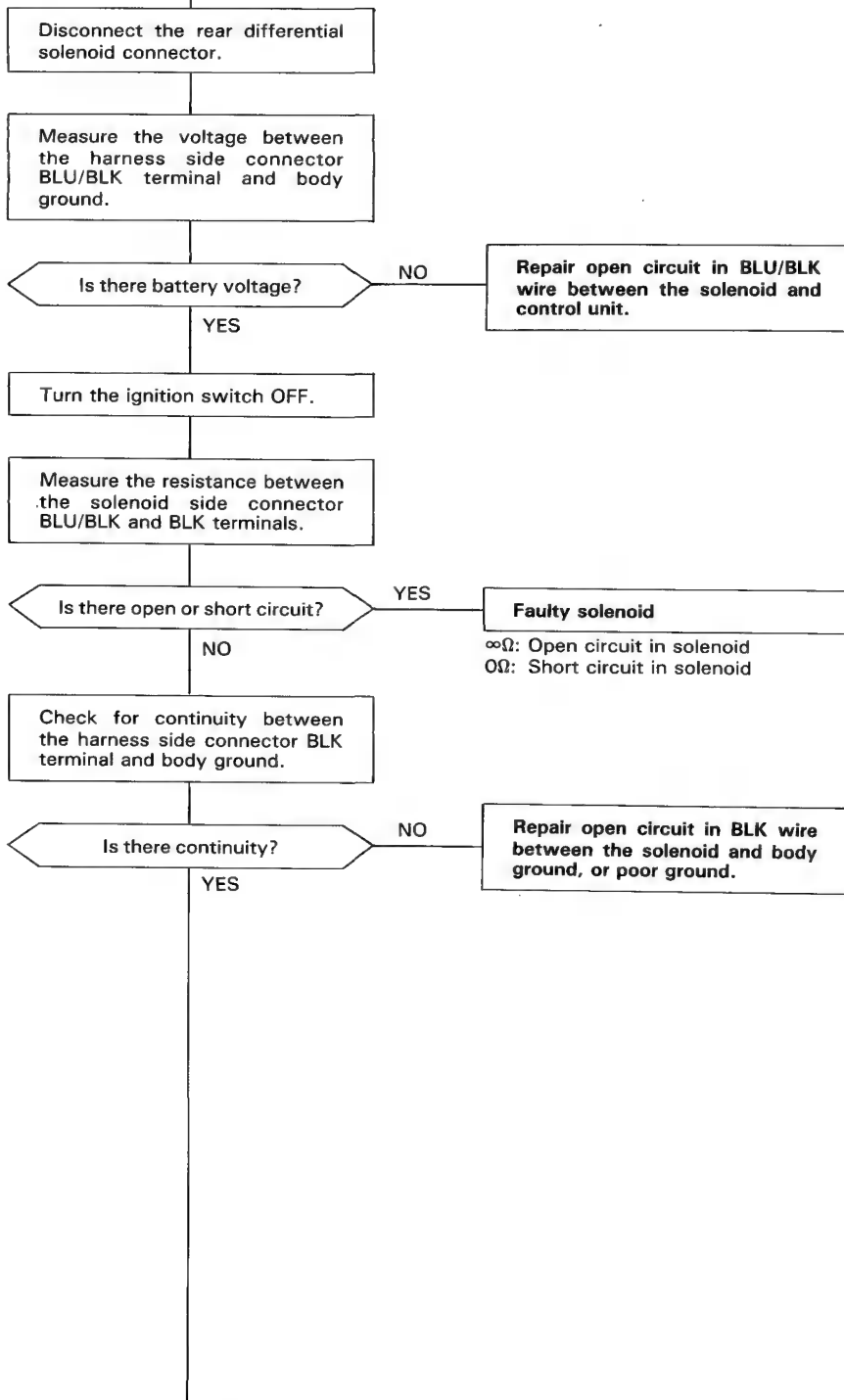
HARNESS SIDE CONNECTOR



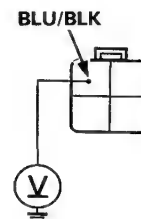
View from terminal side.

(To page 19-105)

(From page 19-104)

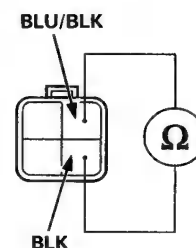


HARNESS SIDE CONNECTOR



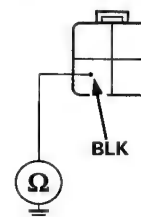
View from terminal side.

SOLENOID SIDE CONNECTOR



View from terminal side.

HARNESS SIDE CONNECTOR



(To page 19-106)

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-105)

Turn the ignition switch ON.

Measure the voltage between the clutch holding relay connector BLU/BLK terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in BLU/BLK wire between the solenoid and clutch holding coil relay.

YES

Connect the solenoid connector.

Connect the clutch holding coil relay connector.

Does the clutch holding coil relay clicks?

NO

Disconnect the control unit 18-P connector.

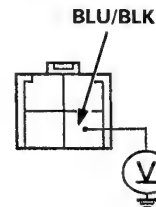
YES

Turn the ignition switch OFF.

Disconnect the clutch holding coil connector.

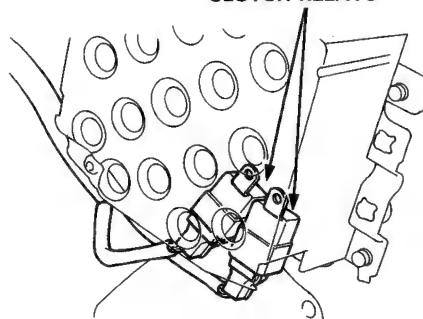
(To page 19-107)

HARNESS SIDE CONNECTOR



View from terminal side.

CLUTCH RELAYS



Wire color of the relay connector:

Holding coil: WHT/BLU, BLU/BLK, BLK/YEL, RED/GRN
Pulling coil: WHT/RED, BLU/RED, BLK/YEL, RED/YEL

18-P CONNECTOR

RED/GRN (SOL 1)



View from control unit terminal side.

Measure the voltage between the control unit connector RED/GRN (SOL 1) terminal and body ground.

Is there battery voltage?

NO

Repair open circuit in RED/GRN wire between the control unit and clutch pulling coil relay.

YES

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

(From page 19-106)

Disconnect the control unit 18-P connector.

Check the continuity between the control unit connector RED/GRN (SOL 1) terminal and body ground.

Is there continuity?

YES

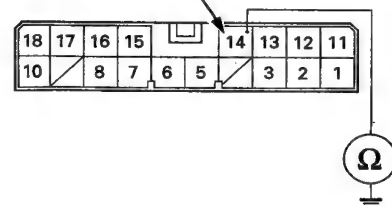
Repair short circuit in RED/GRN wire between the control unit and clutch holding coil relay.

NO

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

18-P CONNECTOR

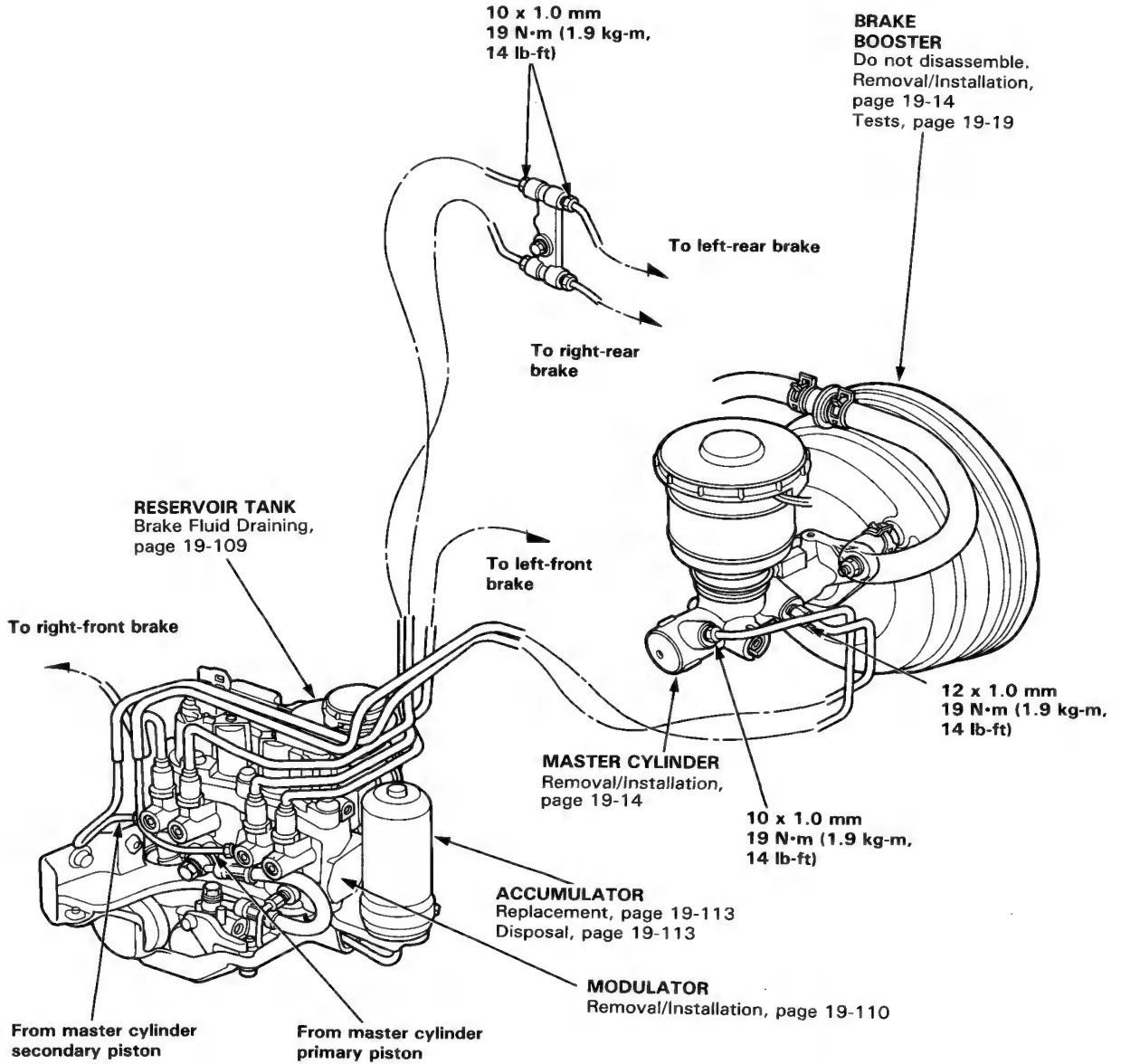
RED/GRN (SOL 1)



View from control unit terminal side.

Index/Hydraulic Connections

CAUTION: Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.



Relieving Accumulator/Line Pressure

⚠ WARNING Use the Bleeder T-wrench before disassembling the parts shaded in the illustration.

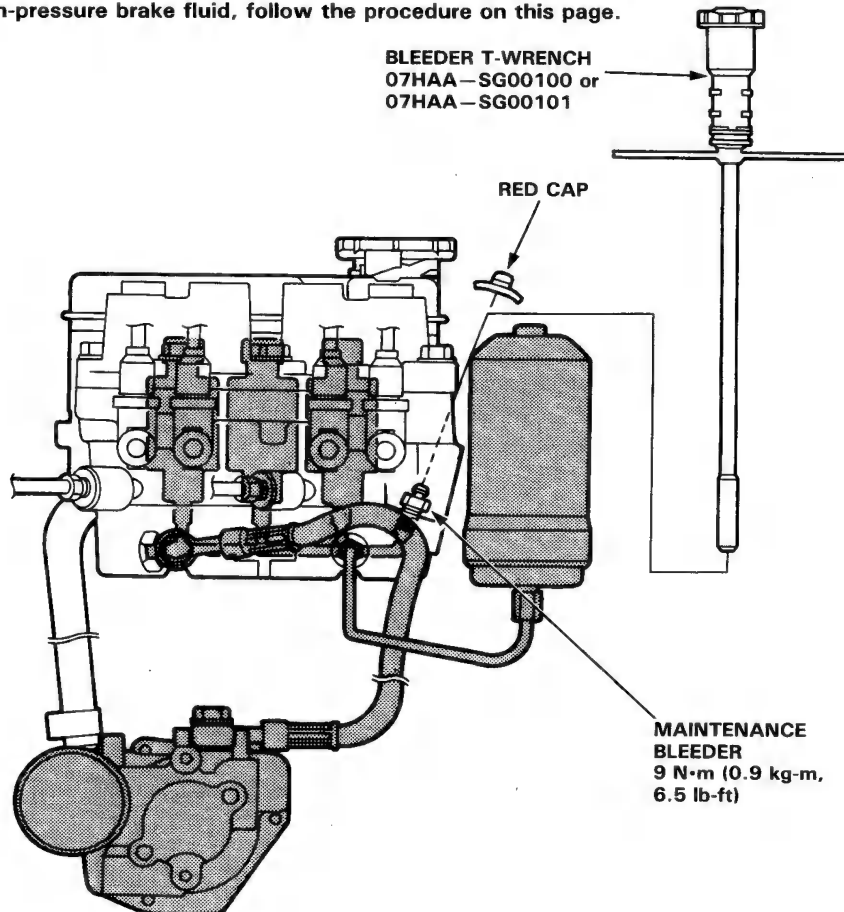
1. Open the hood.
2. Remove the red cap from the bleeder on the modulator body.
3. Install the special tool on the maintenance bleeder and turn it out slowly 90° to collect high-pressure fluid into the reservoir. Turn the special tool out one complete turn to drain the brake fluid thoroughly.
4. Retighten the maintenance bleeder and discard the fluid.
5. Reinstall the red cap.

Reservoir Brake Fluid Draining

1. Draining brake fluid from modulator tank:
The brake fluid may be sucked out through the top of the modulator tank with a syringe. It may also be drained through the pump joint after disconnecting the pump hose.
2. Draining brake fluid from master cylinder:
Loosen the bleed screw and pump the brake pedal to drain the brake fluid from the master cylinder.

⚠ WARNING

- High-pressure fluid will squirt out if the shaded hose and pipe are removed.
- To drain high-pressure brake fluid, follow the procedure on this page.



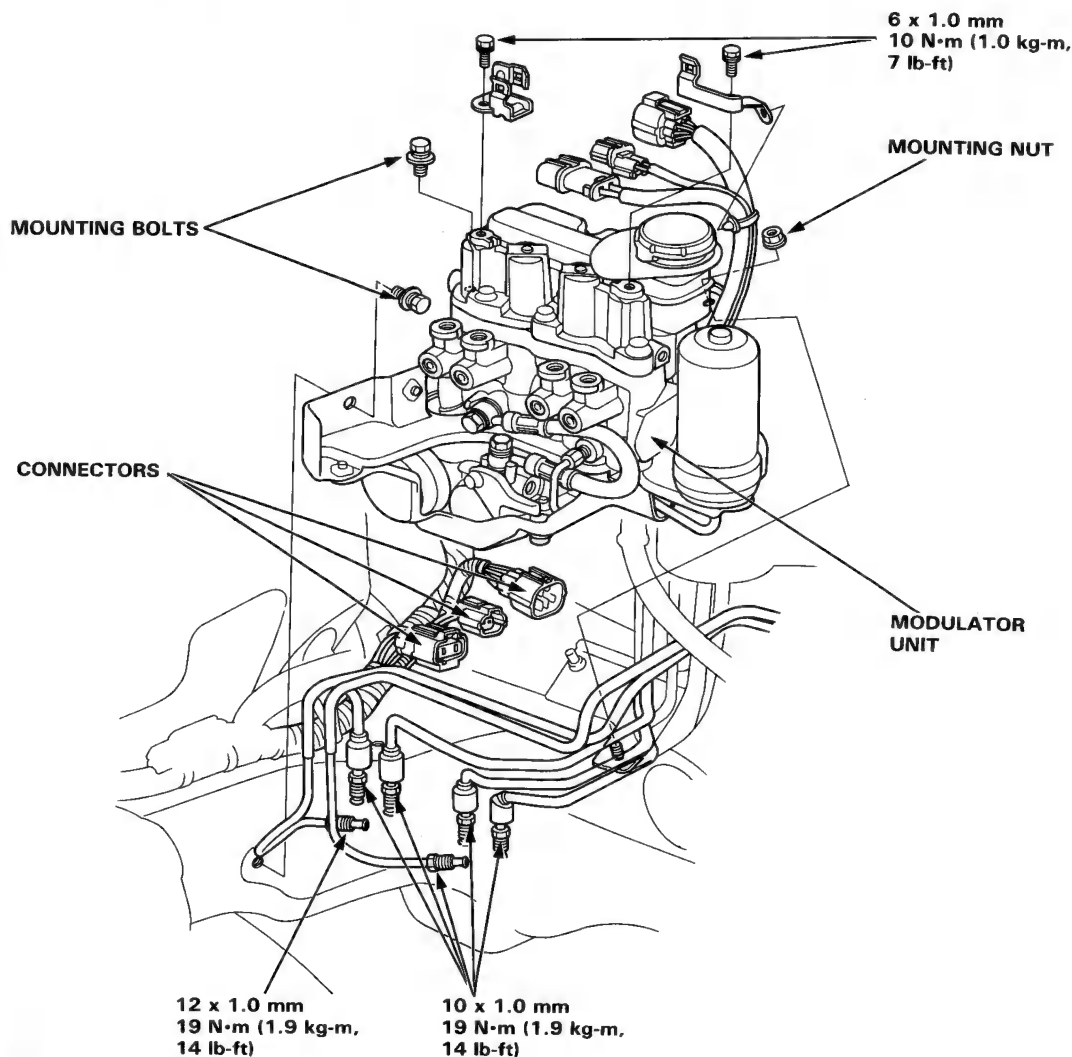
Modulator Unit

Removal/Installation

CAUTION:

- Be careful not to bend or damage the brake pipes when removing the modulator unit.
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.

1. Remove the battery and battery tray.
2. Disconnect the solenoid, motor and pressure switch connectors.
3. Disconnect the brake pipes from the modulator.
4. Remove the two mounting bolts and nut, then remove the modulator unit from the frame.
5. Install the modulator unit in the reverse order of removal.
6. After installation, bleed the air from the system.



Modulator/Pump

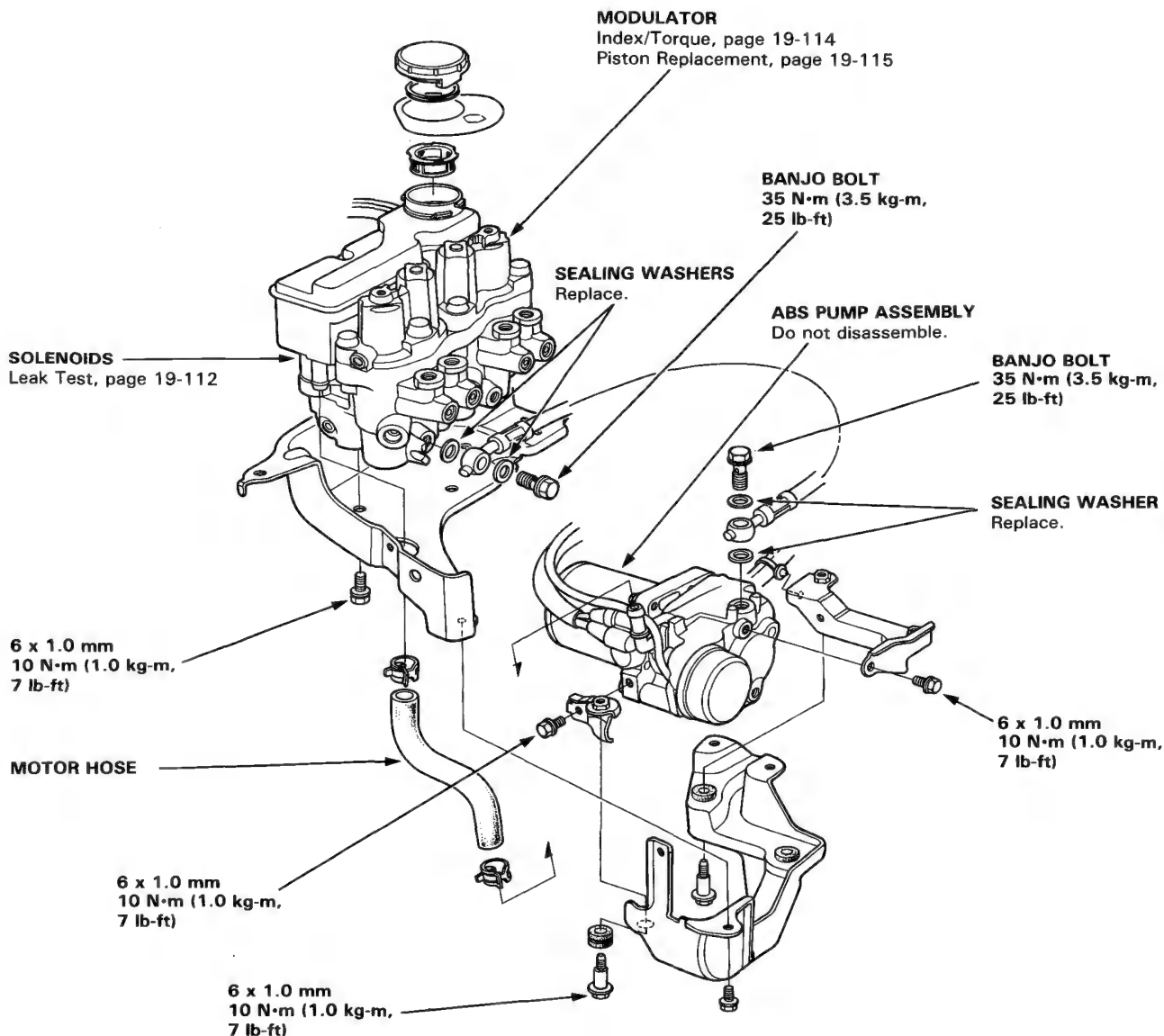


Index/Torque

⚠ WARNING Before removing the modulator-to-pump high-pressure line, be sure to relieve the pressure fluid from the maintenance bleeder (page 19-109).

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- Do not disassemble the pump and pressure switch. Replace the pump and pressure switch as an assembly if they are defective.

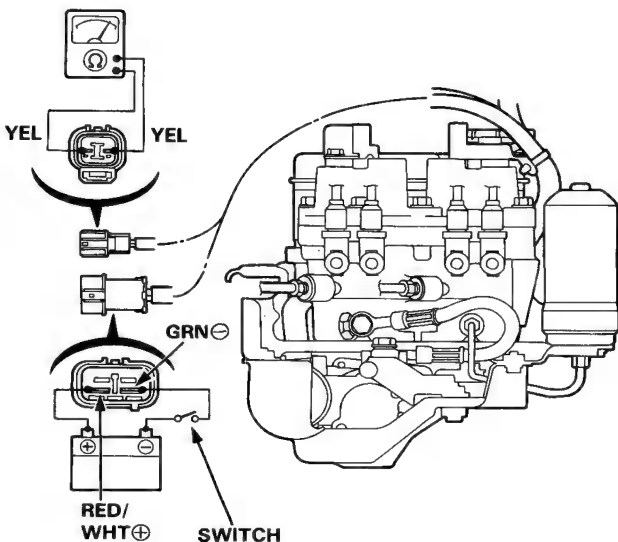


Solenoids

Leak Test

NOTE: If a solenoid leaks excessively, the brake fluid level in the modulator reservoir tank will rise when operating the ABS motor. The modulator reservoir may also overflow.

1. Connect an ohmmeter between the YEL and YEL terminals of the pressure switch connector.
2. Attach the positive (+) lead of a fully charged 12 V battery to the RED/WHT terminal of the motor connector and negative (-) lead to the GRN terminal, and install a switch between negative lead and GRN terminal as shown.
3. Turn the switch on to allow sufficient pressure to build up within the accumulator and check for continuity. If the ohmmeter shows continuity (pressure switch turned on), run the motor for 10 seconds more, then turn the switch off.



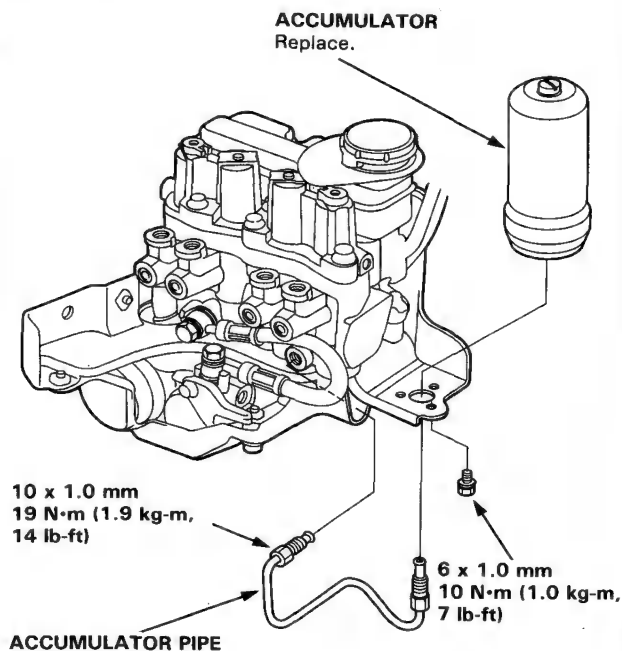
- Check if the solenoid hisses or squeaks. Replace the modulator if the solenoid hisses or squeaks.
- Check the pressure switch for continuity within 30 minutes. It is normal if there is continuity. If there is no continuity, a solenoid is faulty or high-pressure line leaks.

Accumulator

Replacement

⚠ WARNING Before removing the modulator-to-accumulator high pressure line, be sure to relieve the pressure fluid from the maintenance bleeder (page 19-109).

1. Loosen the flare nuts and remove the accumulator pipe.
2. Remove the three mounting bolts and the accumulator from the modulator unit.

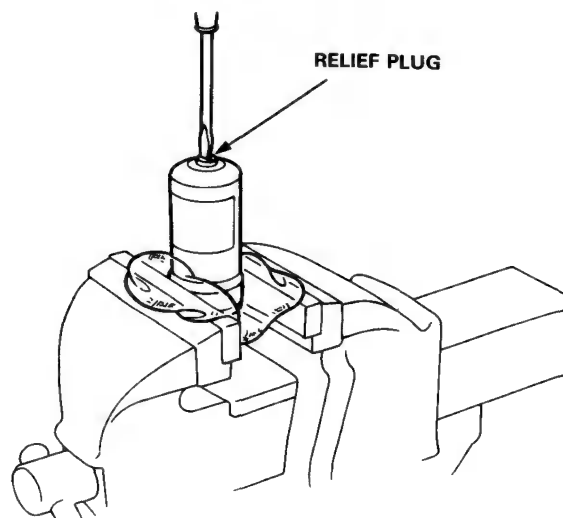


3. Install a new accumulator in the reverse order of removal.
4. Bleed the air from the high-pressure line (page 19-117).

Disposal

⚠ WARNING The accumulator contains high pressure nitrogen gas. Do not puncture, expose to the flame, or attempt to disassemble the accumulator or it may explode and severe personal injury may result.

1. Secure the accumulator in a vise so that the relief plug points straight up.
2. Slowly turn the plug 3-1/2 turns and then wait 3 minutes for all pressure to escape.
3. Remove the plug completely and dispose of the accumulator.

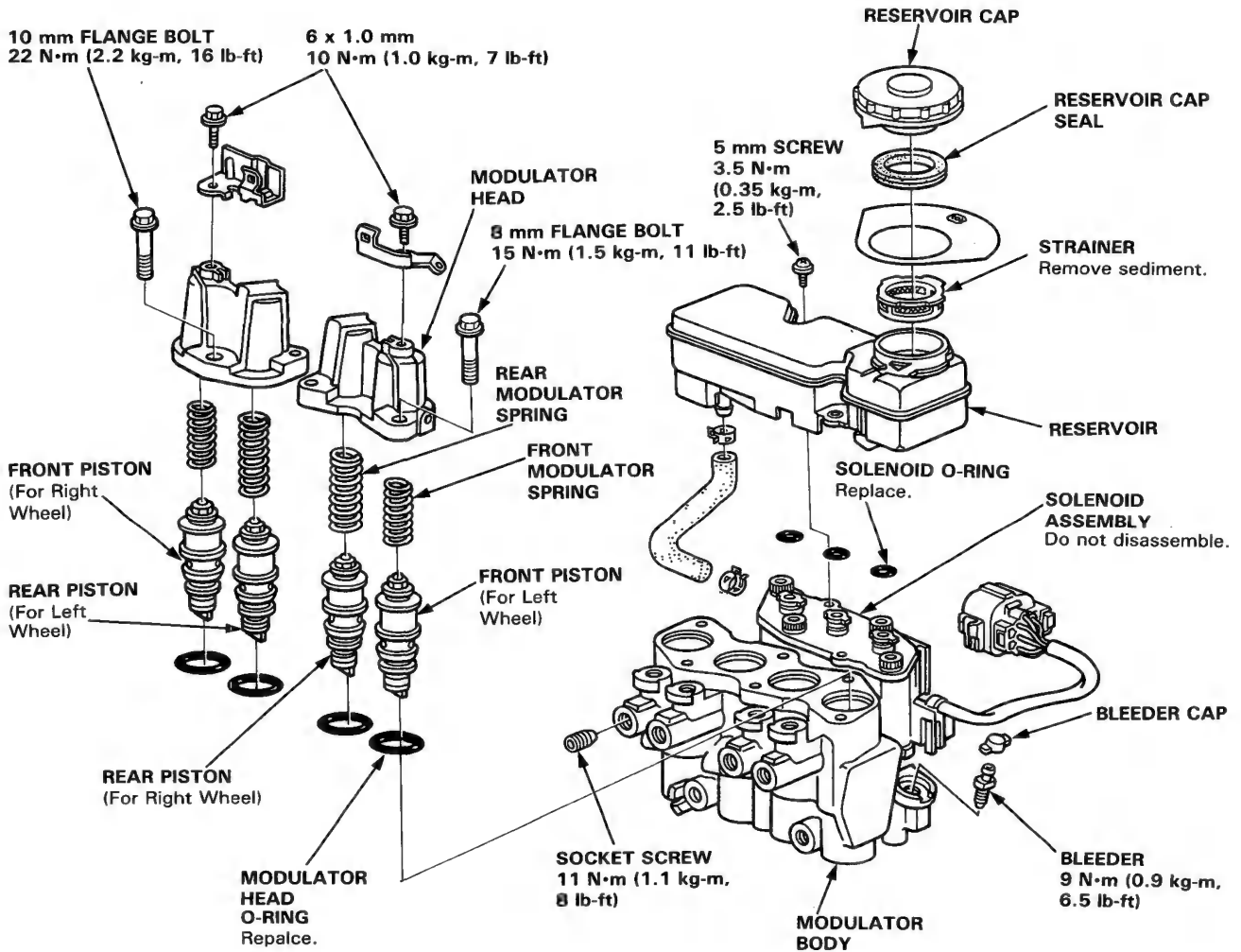


Modulator

Index/Torque

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.



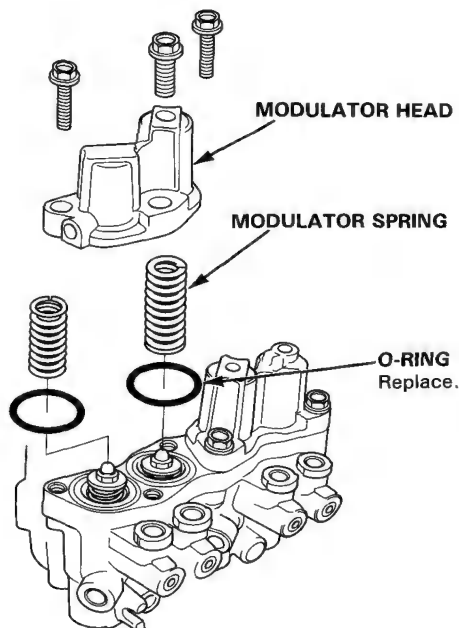
Piston

Replacement

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

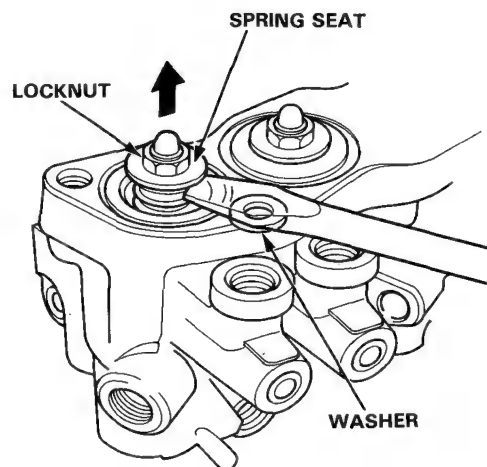
1. Remove the modulator head.
2. Remove the modulator springs and O-rings.



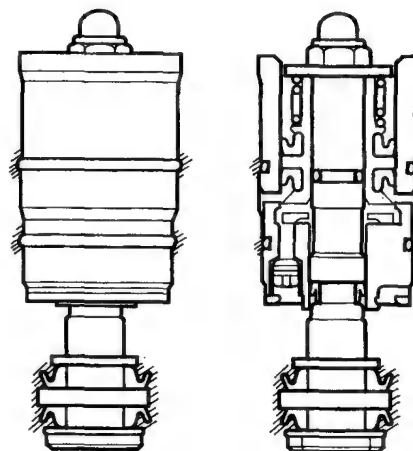
3. Insert the screwdriver under the spring seat, pry the piston assembly off slightly, then pull the piston assembly while grasping the locknut with pliers.

NOTE:

- Place a suitable washer between the screwdriver and modulator body to prevent damage to the modulator body.
- Be careful not to damage the piston sleeve.



4. Apply rubber grease to the shaded areas of a new piston assembly as shown.

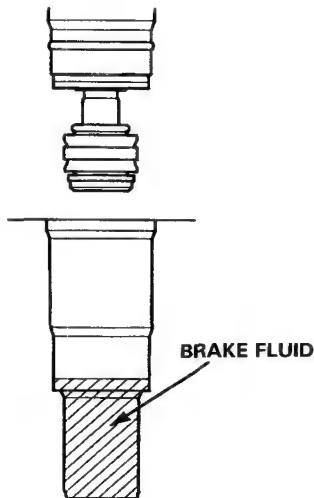


(cont'd)

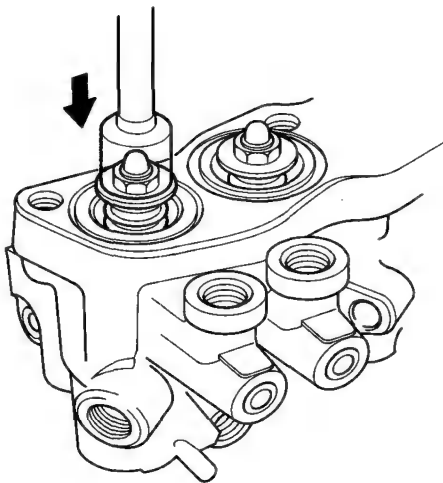
Piston

Replacement (cont'd)

5. Pour brake fluid into the piston hole in the modulator body.
6. Coat the sliding surface of the piston with brake fluid and install the piston assembly into the modulator body.



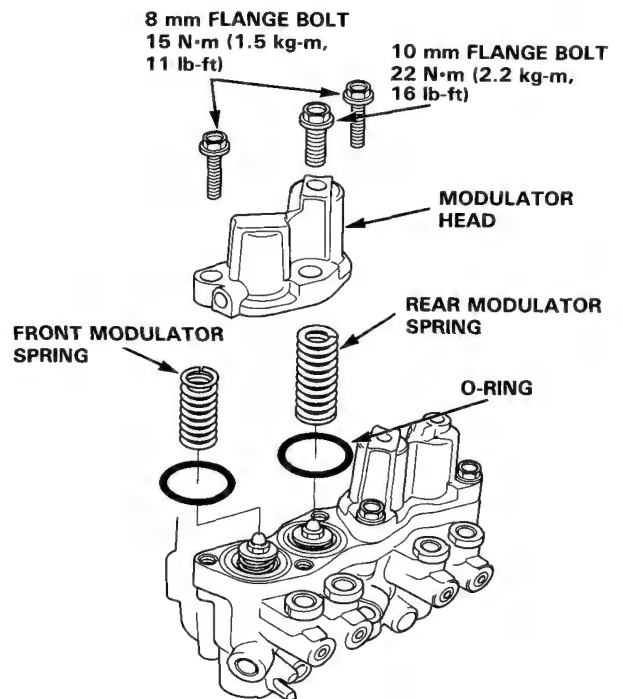
7. Push down the piston several times until no bubbles come out from the solenoid side.



8. Install new O-rings into the grooves in the modulator body.
9. Install the modulator springs.

NOTE: Do not interchange the front and rear modulator springs. The longer spring is the rear modulator spring.

10. Install the modulator head onto the body, being careful not to bind the O-rings.



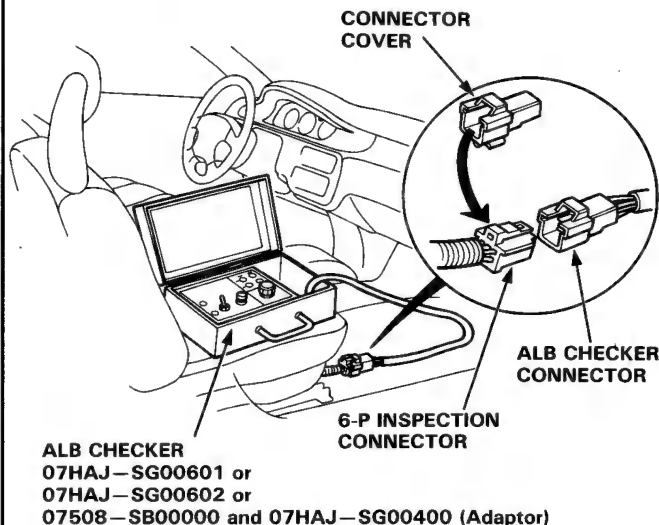
Bleeding

Air Bleeding with ALB Checker

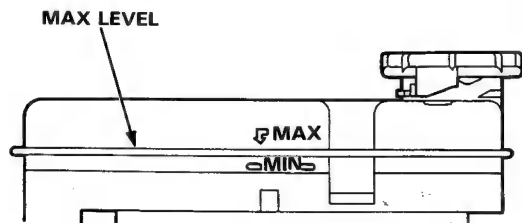
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

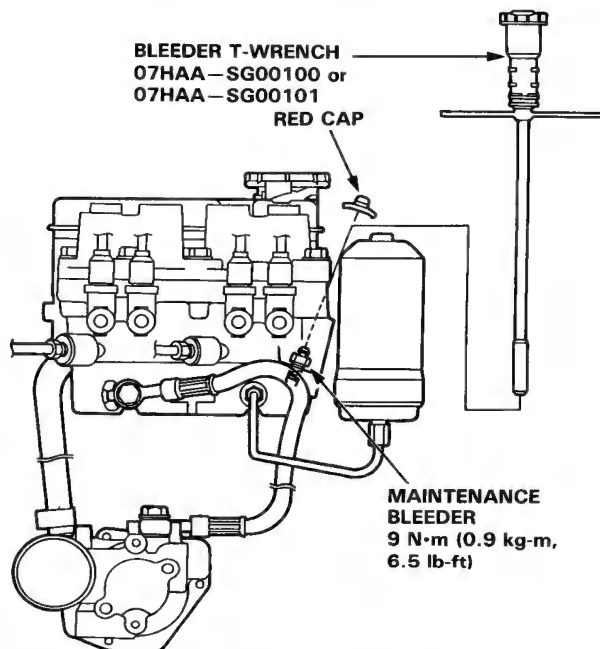
1. Place the vehicle on level ground with the wheels blocked. Put the transmission in neutral for manual transmission models, and in P for automatic transmission models. Release the parking brake.
2. Disconnect the 6-P inspection (orange) connector from the cross-member under the passenger's seat and connect the inspection connector to the ALB checker.



3. Fill the modulator reservoir to the MAX level and install the reservoir cap.



4. Start the engine and allow it to idle for a few minutes, then stop it. Check the fluid level in the modulator reservoir and refill to the MAX level if necessary.
5. Bleed high-pressure fluid from the maintenance bleeder with the special tool.



6. Start the engine and allow it to idle for a few minutes, then stop it. Check the fluid level in the modulator reservoir and refill to the MAX level if necessary.
7. Turn the Mode Selector switch of the checker to 2.
8. While depressing the brake pedal firmly, push the Start Test switch to operate the modulator. There should be kickback on the brake pedal. If not, repeat steps 5 to 8.

NOTE: Continue to depress the brake pedal firmly when operating the checker.

9. Turn the Mode Selector to 3, 4, and 5. Perform step 8 for each of the test mode positions.
10. Refill the modulator reservoir to the MAX level and install the reservoir cap.

⚠ WARNING Disconnect the ALB checker before driving the car. A collision can result from a reduction, or complete loss of braking ability causing severe personal injury or death.

Master Cylinder



Index/Inspection

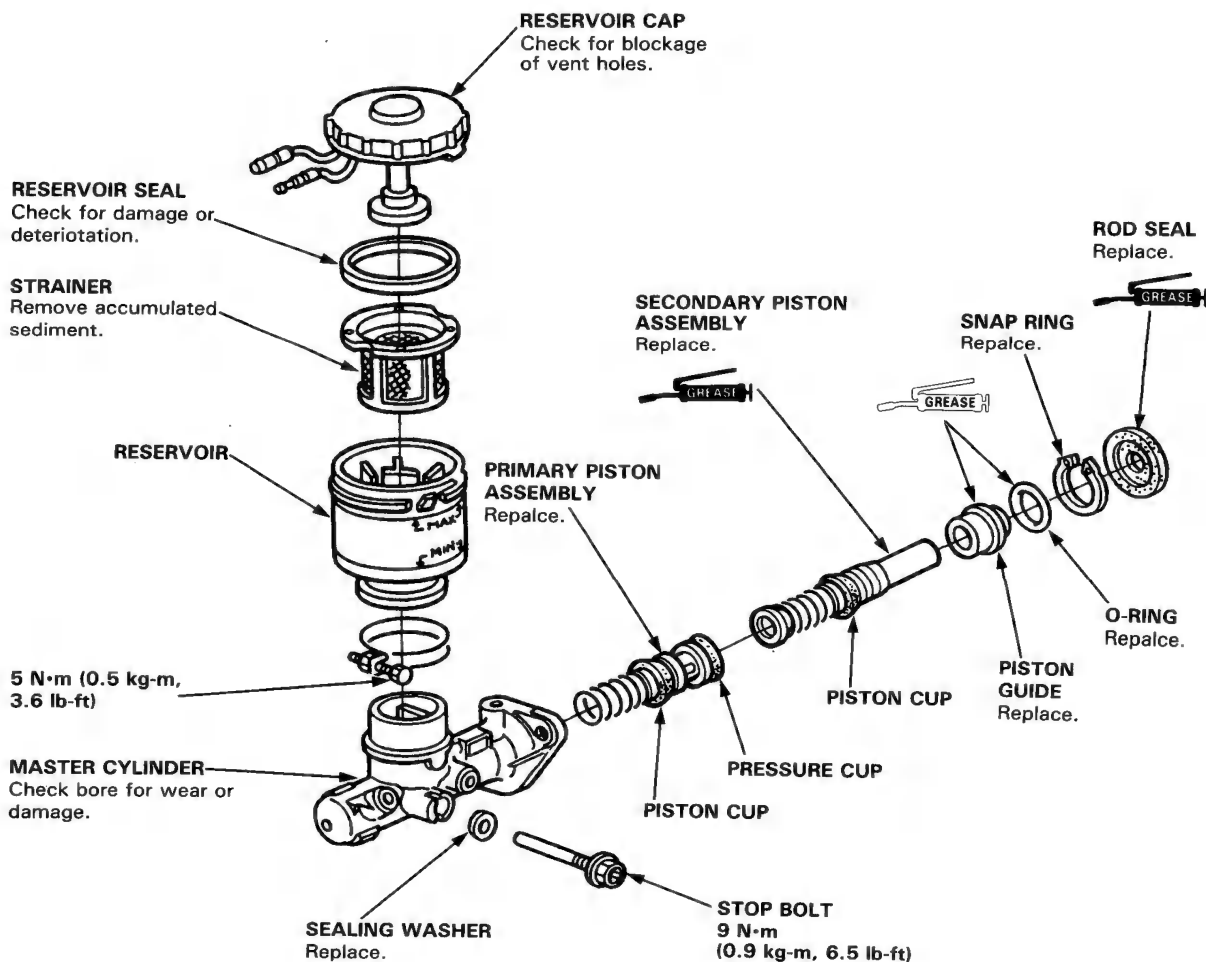
CAUTION:

- Do not spill brake fluid on the car, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.

NOTE:

- Coat piston cup, pressure cup and master cylinder bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

: Brake Cylinder Grease (P/N:08733—B020E) or equivalent rubber grease. : Silicone grease.

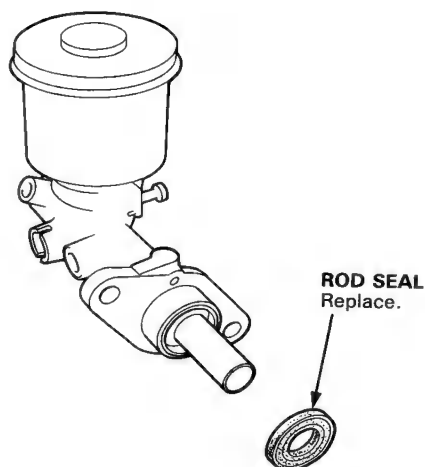


Disassembly

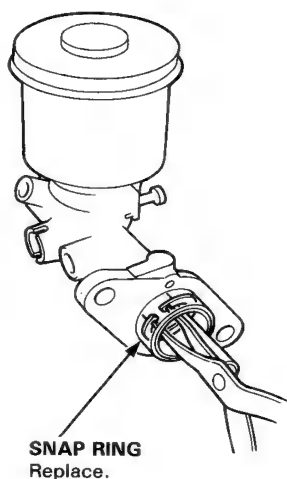
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

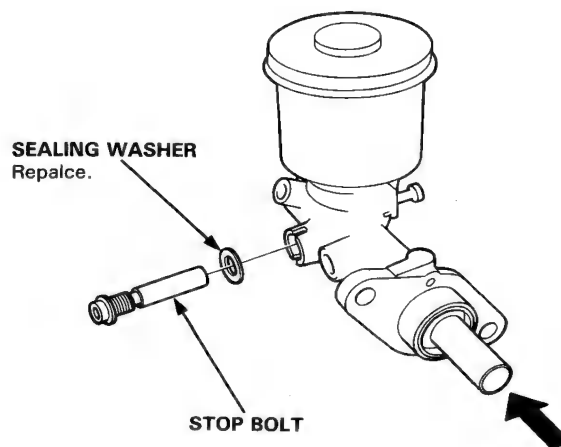
1. Remove the rod seal.



2. Push the secondary piston assembly, then remove the snap ring.



3. Remove the stop bolt while pushing in the secondary piston assembly.



4. Remove the piston guide, secondary piston assembly and primary piston assembly.

NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side port.

CAUTION:

- Do not use high pressure air or bring the nozzle too close to the port.
- Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.

Master Cylinder

Reassembly

CAUTION:

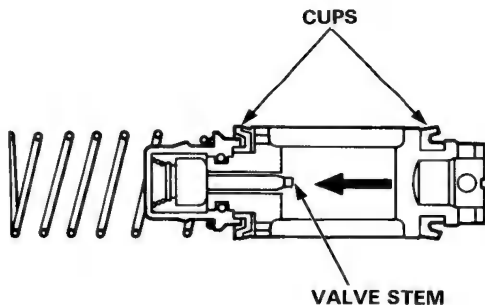
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.)
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

1. Coat the cups of a new primary piston assembly into the master cylinder.

NOTE:

- Before installation, check that the valve stem moves smoothly by lightly pushing it through the slot in the piston.
- Install the piston so that the slot in the piston align with the stop bolt hole in the master cylinder.

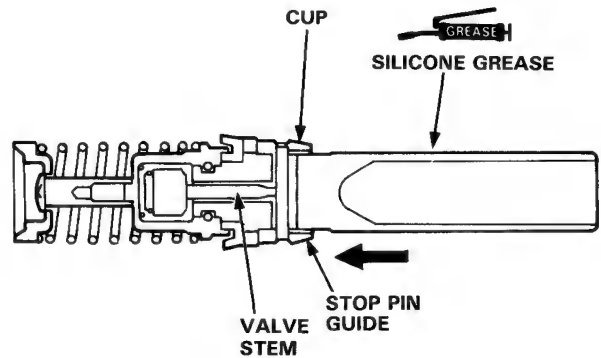
PRIMARY PISTON ASSEMBLY



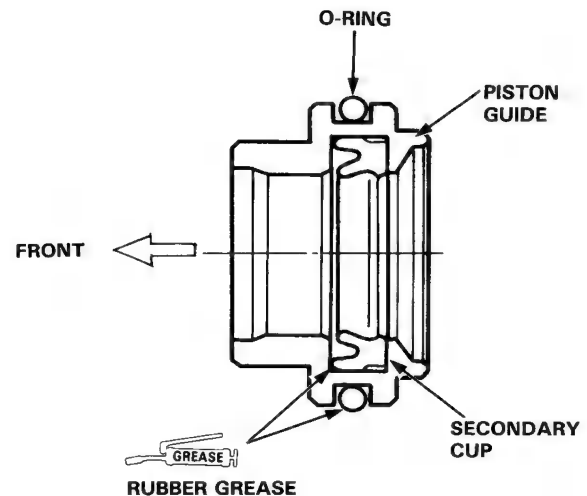
2. Coat the cup of a new secondary piston with brake fluid, apply silicone grease to the piston and install the piston into the master cylinder.

NOTE: Check that the valve stem moves smoothly by pushing the stop pin guide.

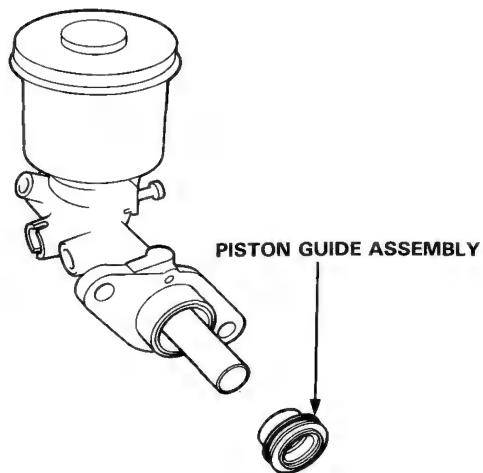
SECONDARY PISTON ASSEMBLY



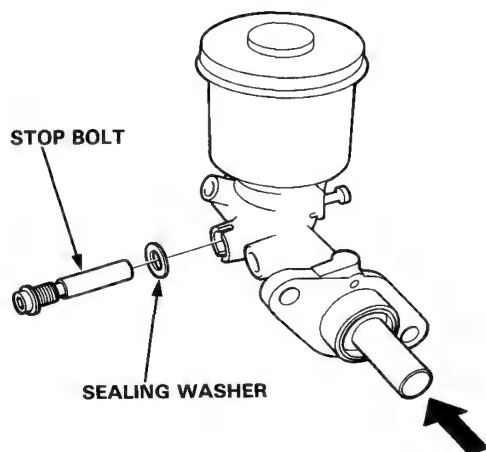
3. Apply Brake Cylinder Grease (P/N: 08733—B020E) or equivalent rubber grease to a new O-ring and the secondary cup in a new piston guide, and install the O-ring onto the piston guide.



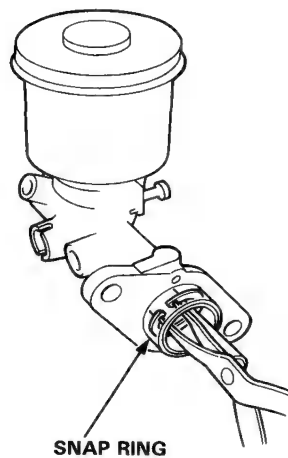
4. Install the piston guide assembly into the master cylinder.



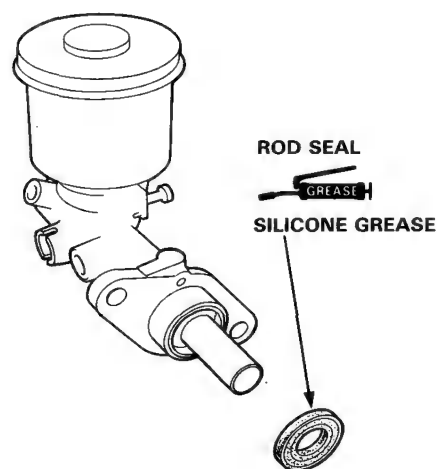
5. Align the slot in the primary piston with the stop bolt hole by pushing the secondary piston in, and install the stop bolt with a new sealing washer.



6. Install a new snap ring while pushing in the secondary piston.



7. Apply silicone grease to a new rod seal and install the seal onto the master cylinder.



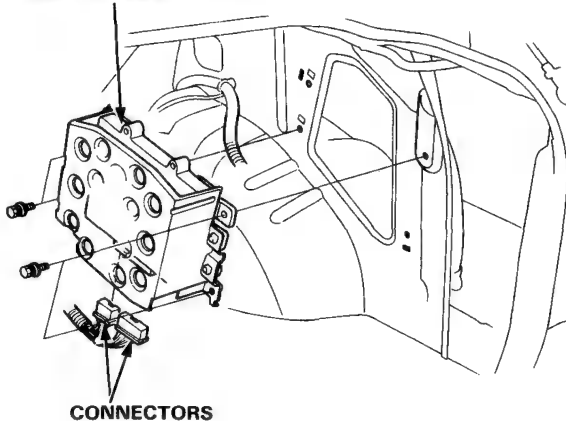
Electronic Components

Control Unit Replacement

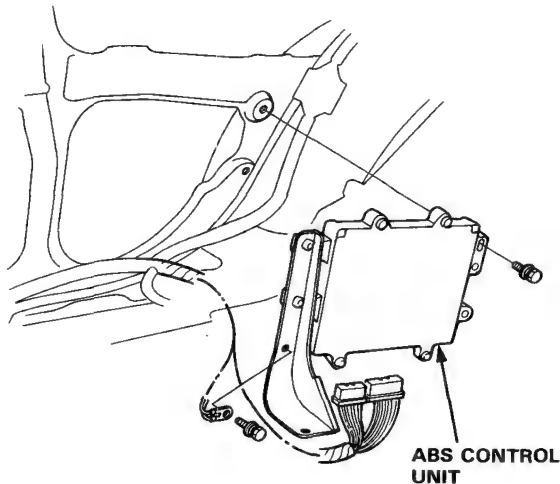
1. 4-door: Remove the right trunk side trim panel.
3-door: Remove the right quarter trim panel.
2. Disconnect the control unit connectors.
3. Remove the control unit attaching bolts, then remove the control unit.

4-door

ABS CONTROL UNIT



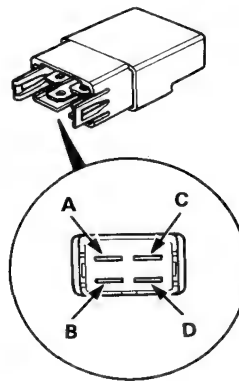
3-door



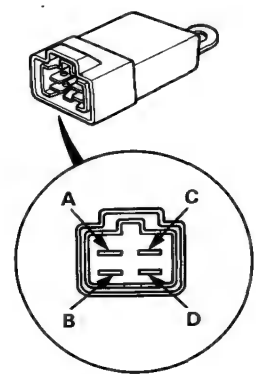
Relay Inspection

1. Remove the fail-safe relay and motor relay from the under-hood ABS fuse/relay box (Location: page 19-60).
2. Check for continuity between the terminals C and D.
There should be continuity.
3. Check for continuity between the terminals A and B.
There should be continuity when the battery is connected between the terminals C and D.
There should be no continuity when the battery is disconnected.

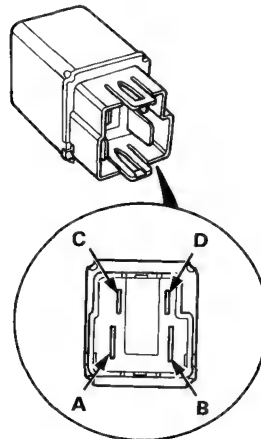
Fail-Safe Relay



Clutch Relay



Motor Relay



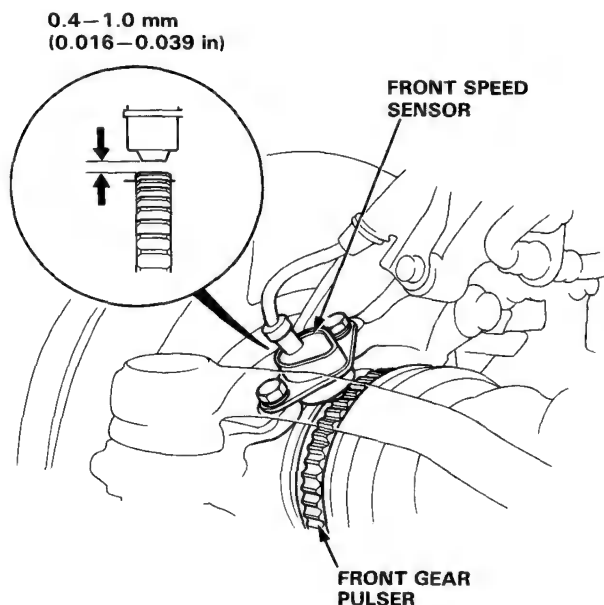
Inspection

Front

1. Check the pulser for chipped or damaged teeth and replace if necessary.
2. Measure the air gap between the sensor and pulser all the way around while rotating the driveshaft by hand.

Standard: 0.4–1.0 mm (0.016–0.039 in)

NOTE: If the gap exceeds 1.0 mm (0.039 in) at any point, the probability is a distorted knuckle, which should be replaced.

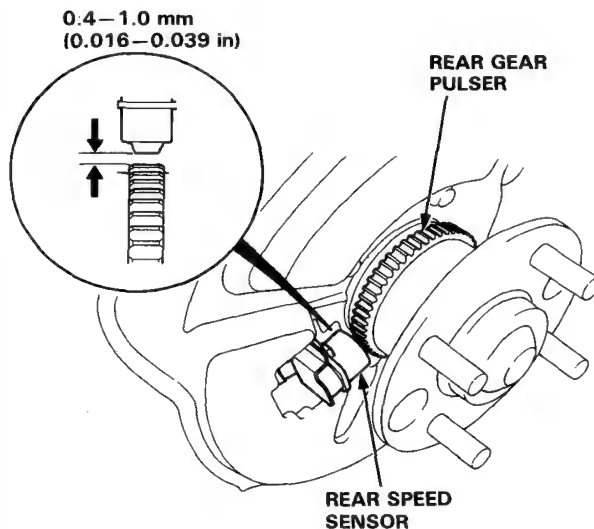


Rear (2WD)

1. Remove the rear caliper assembly.
2. Remove the rear brake disc.
3. Check the rear pulser for chipped or damaged teeth and replace if necessary.
4. Measure the air gap between the sensor and pulser all the way around while rotating the hub bearing unit by hand.

Standard: 0.4–1.0 mm (0.016–0.039 in)

NOTE: If the gap exceeds 1.0 mm (0.039 in) at any point, the probability is a distorted spindle, which should be replaced.



Rear (4WD)

1. Check the pulser for chipped or damaged teeth and replace if necessary.
2. Measure the air gap between the sensor and pulser all the way around while rotating the driveshaft by hand.

Standard: 0.4–1.2 mm (0.016–0.047 in)

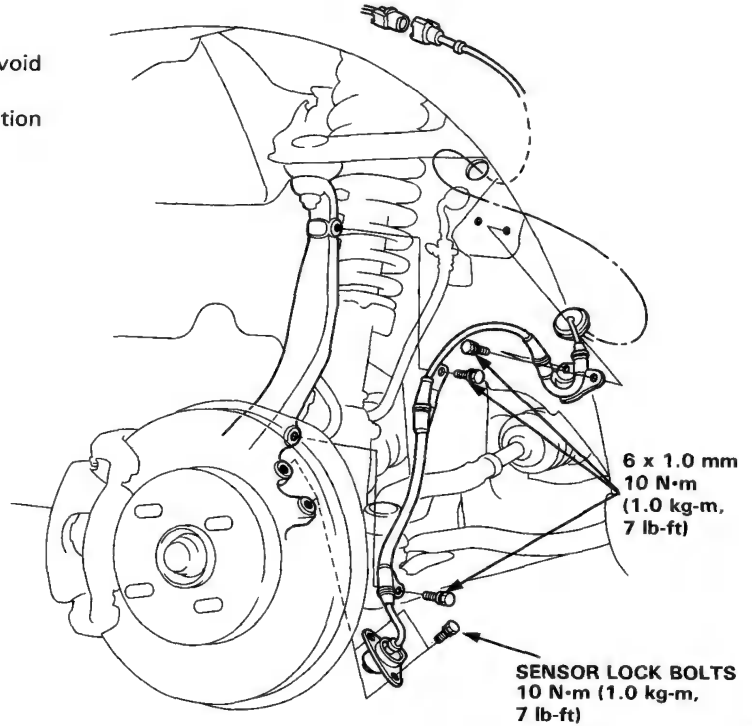
NOTE: If the gap exceeds 1.2 mm (0.047 in) at any point, the probability is a distorted bearing holder, which should be replaced.

Pulsers/Sensors

Front Sensor Replacement

NOTE:

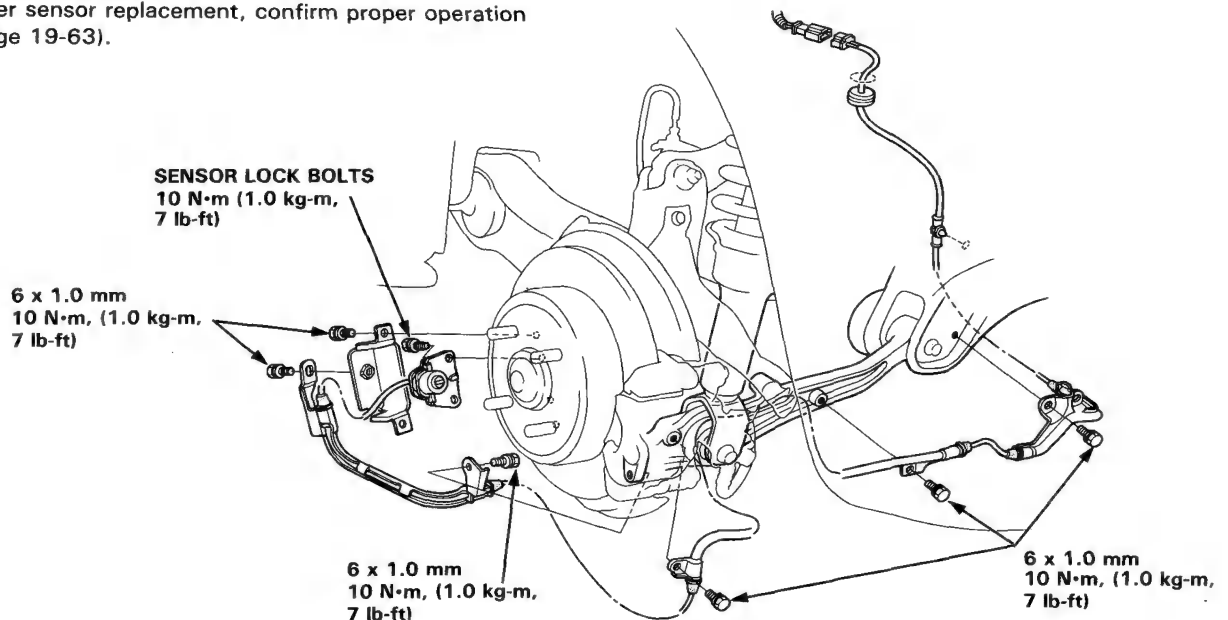
- Be careful when installing the sensors to avoid twisting the wires.
- After sensor replacement, confirm proper operation (page 19-63).



Rear Sensor Replacement (2WD)

NOTE:

- Be careful when installing the sensors to avoid twisting the wires.
- After sensor replacement, confirm proper operation (page 19-63).

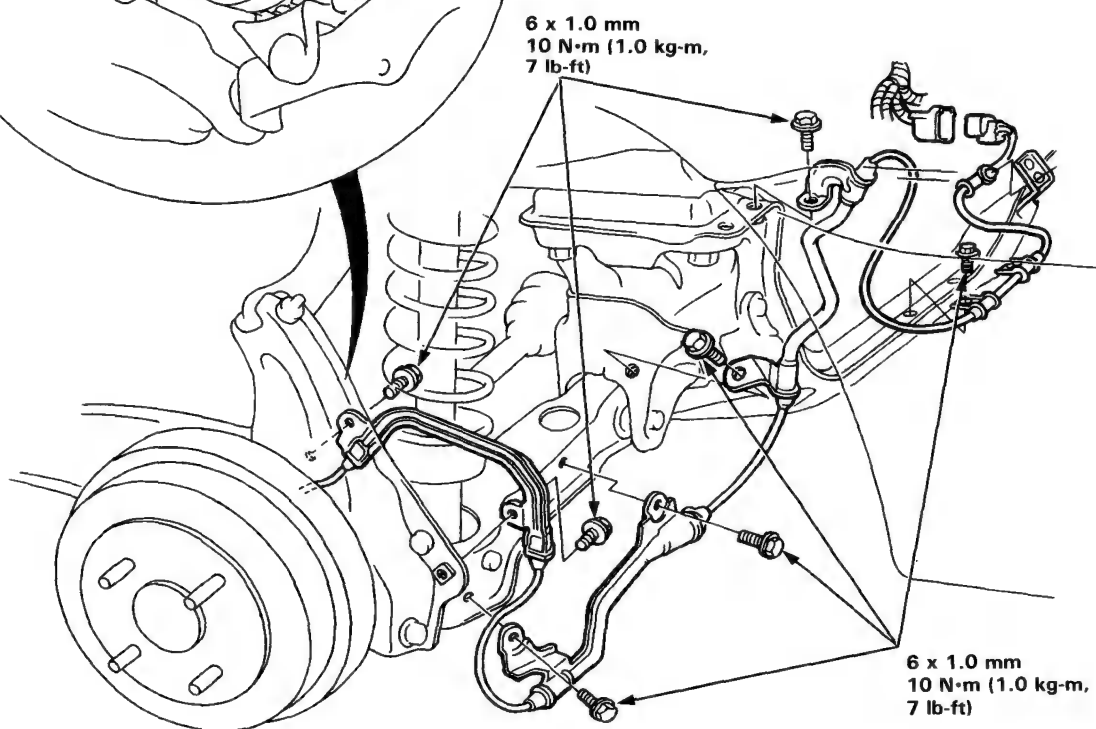
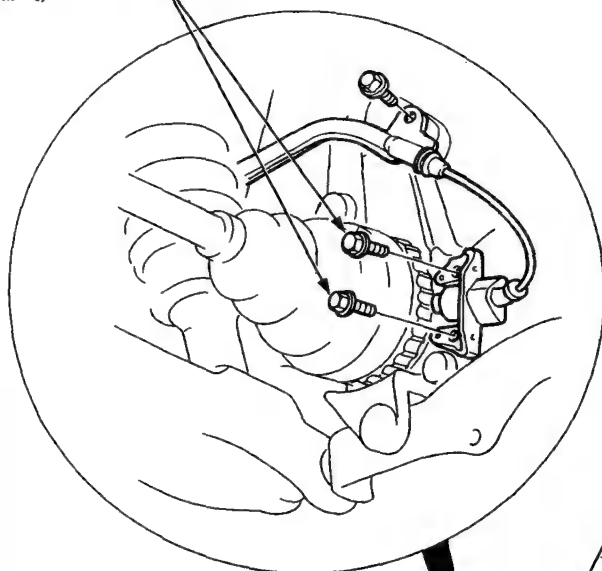


Rear Sensor Replacement (4WD)

NOTE:

- Be careful when installing the sensors to avoid twisting the wires.
- After sensor replacement, confirm proper operation (page 19-63).

SENSOR LOCK BOLTS
10 N·m (1.0 kg-m,
7 lb-ft)



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if body maintenance is required)

Some models of the CIVIC include a driver's side airbag, located in the steering wheel hub, as part of a Supplemental Restraint System (SRS). Information necessary to safely service the SRS is included in this shop manual. Items marked * on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special cautions and tools, and should therefore be done only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, can lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

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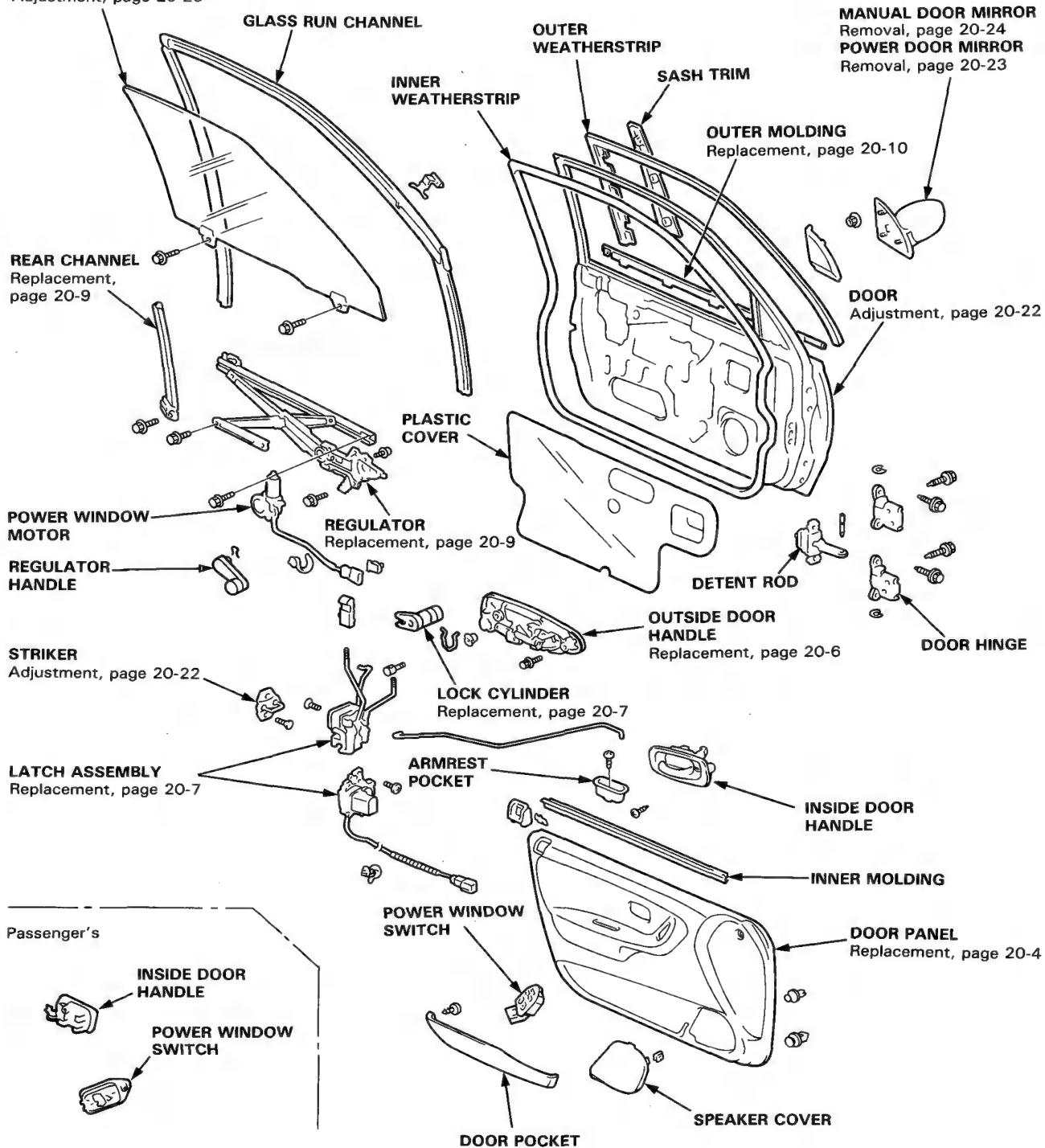
Front Door

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4D:

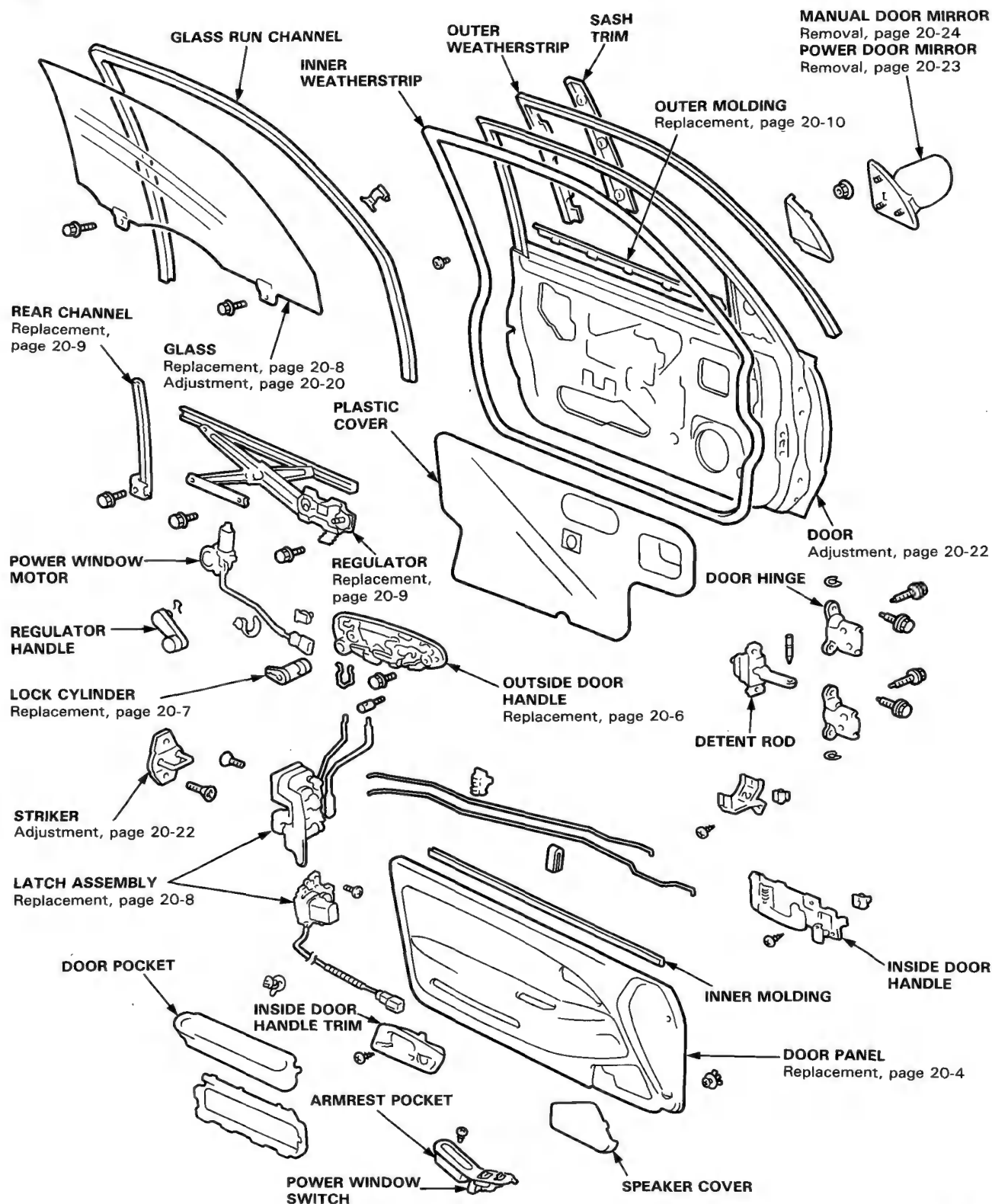
GLASS

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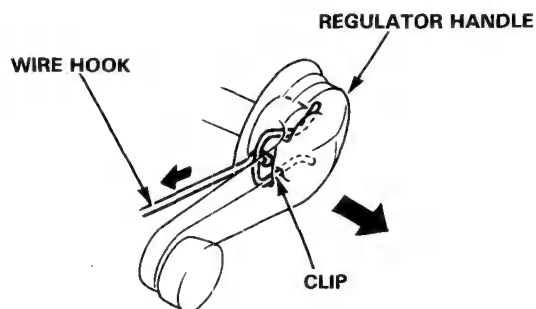
3D:



Front Door

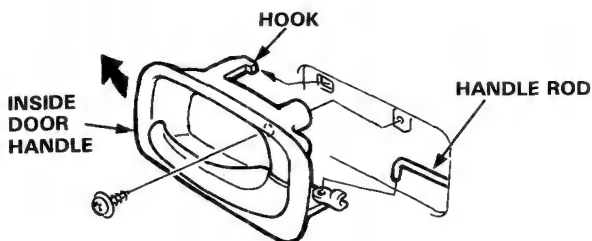
Door Panel/Plastic Cover Replacement

1. If applicable, remove the regulator handle by pulling the clip out with a wire hook.

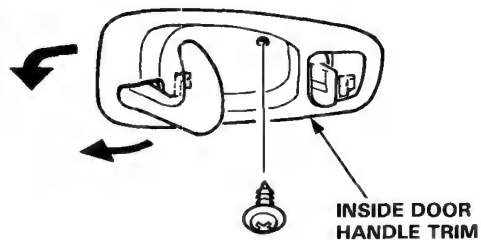


2. Remove the mounting screw, then pull the inside door handle out half-way.

4D:

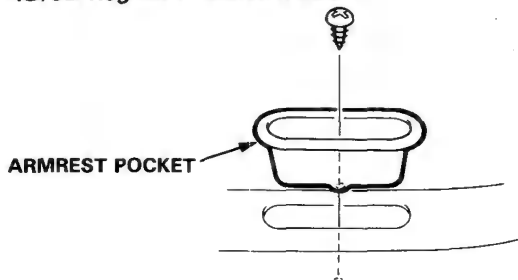


- 3D: Remove the mounting screw, then remove the trim while pulling the handle.

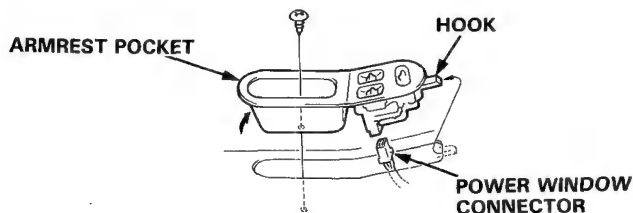


3. Remove the mounting screw, then remove the armrest pocket.

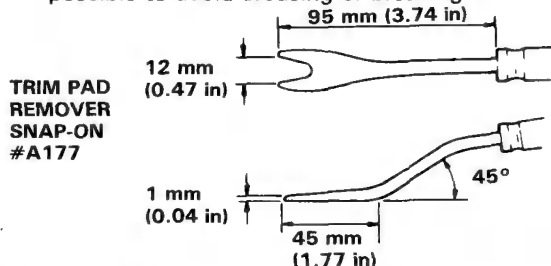
4D/3D Regulator handle model:



3D Power window model:



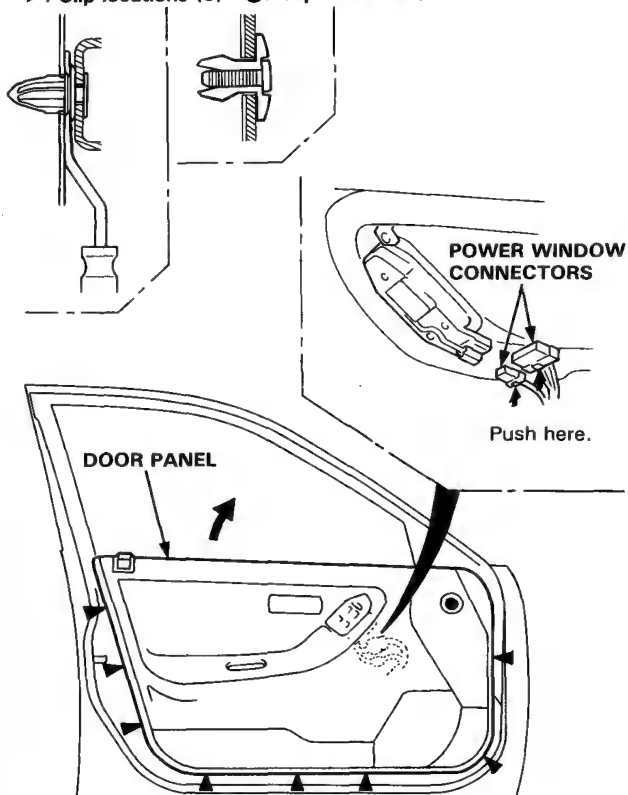
NOTE: Remove the panel with as little bending as possible to avoid creasing or breaking it.



4. Remove the clips attaching the door panel (See trim pad remover). Remove the door panel by pulling it upward.

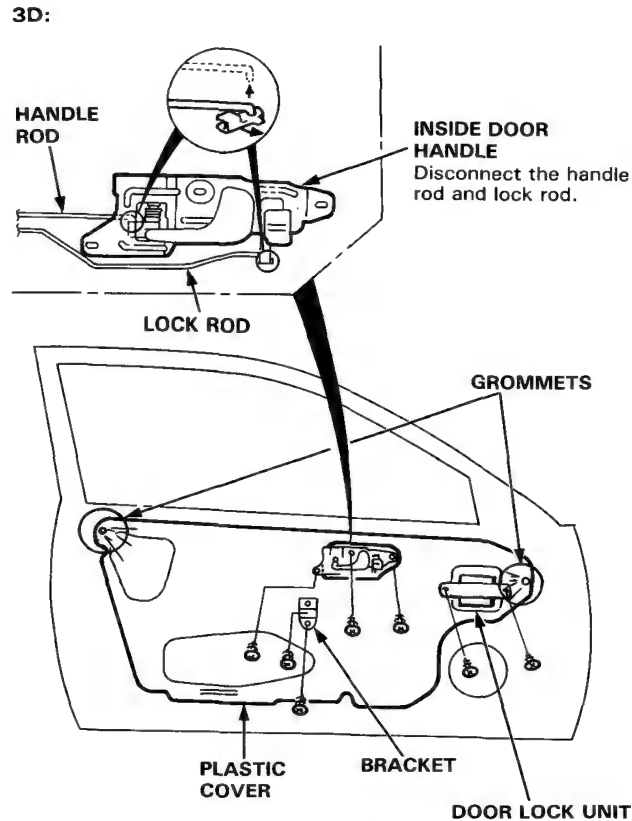
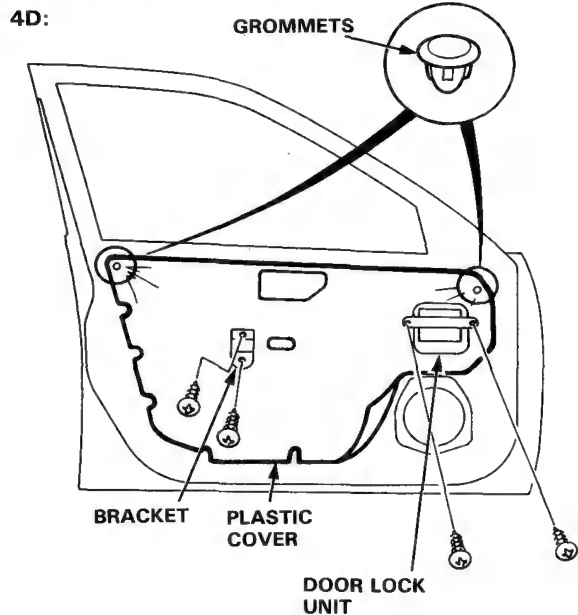
If applicable, disconnect the power window connector.

► : Clip locations (8) ● : Clip locations (1)





5. Remove the grommets, bracket, door lock unit and inside door handle (3D), then carefully remove the plastic cover.

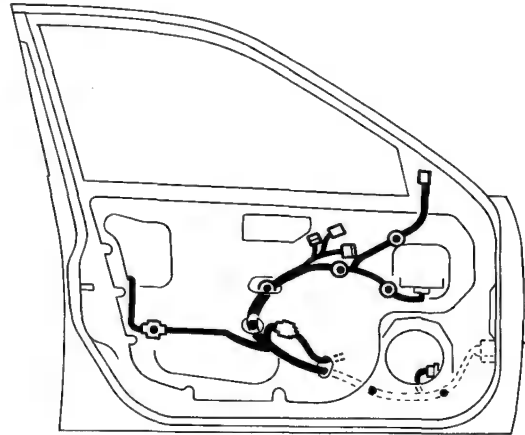


6. Install the door panel and plastic cover in the reverse order of removal.

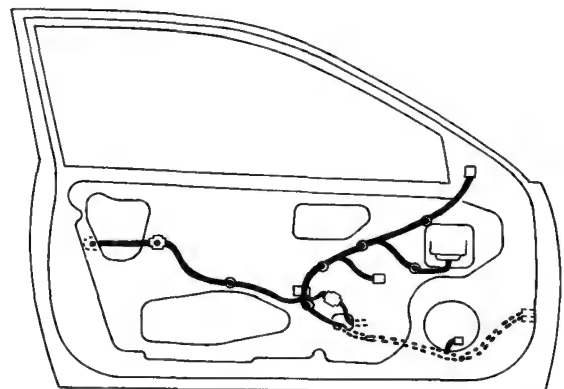
NOTE: Make sure the wire harnesses and connectors are fastened correctly on the door.

●: Harness clip locations

4D:



3D:

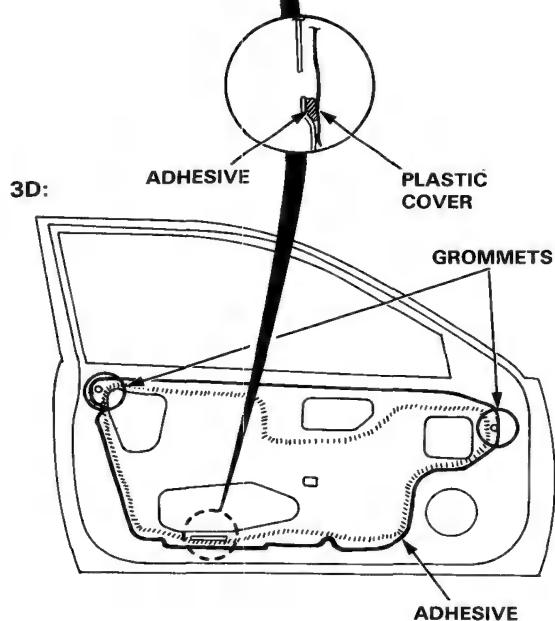
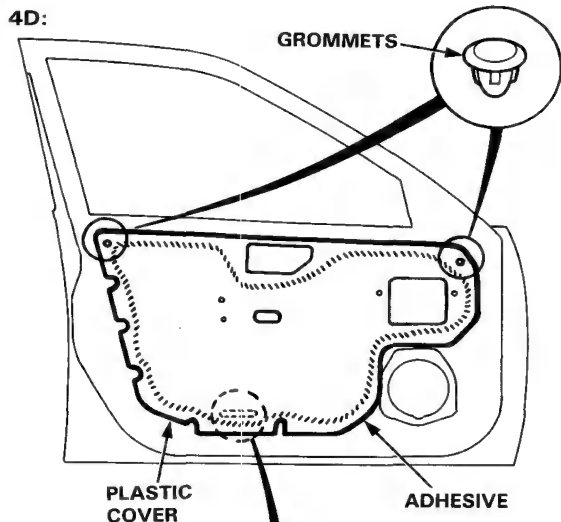


(cont'd)

Front Door

Plastic Cover Replacement (cont'd)

- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/water leaks.



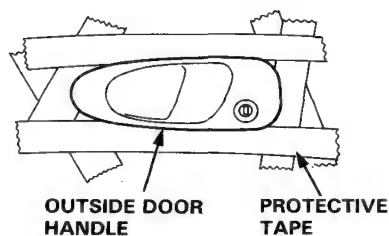
- Before tightening the door panel mounting screws, make sure the wire harnesses are not pinched.

Outside Door Handle Replacement –

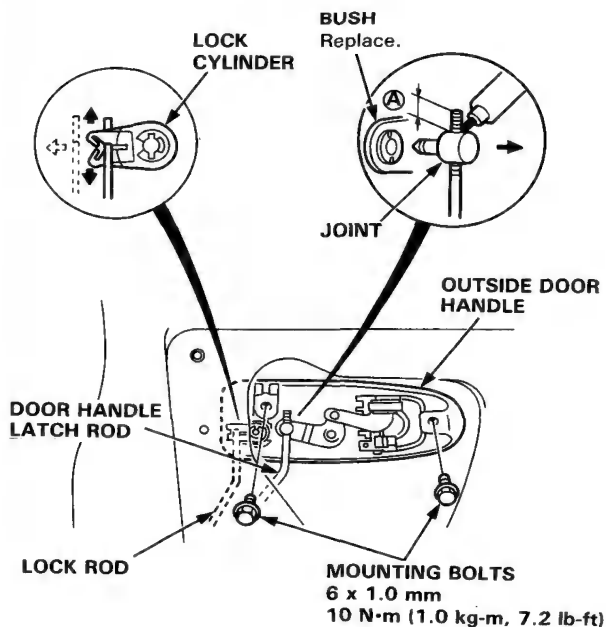
NOTE: Raise the window fully.

1. Remove:
 - Door panel (page 20-4)
 - Plastic cover (page 20-5)
2. Pry the door handle latch rod and lock rod out of their joints using a flat tip screwdriver. Remove the mounting bolts, then remove the outside door handle.

NOTE: Use protective tape around the outside door handle to prevent damage.

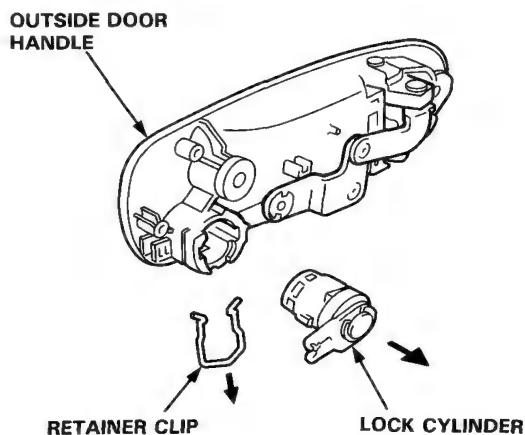


- To ease reassembly, note the location A of the rod on the joint before disconnecting it.





3. Pull out the retainer clip, then remove the lock cylinder.



4. Installation is the reverse of the removal procedure.

Door Latch Replacement

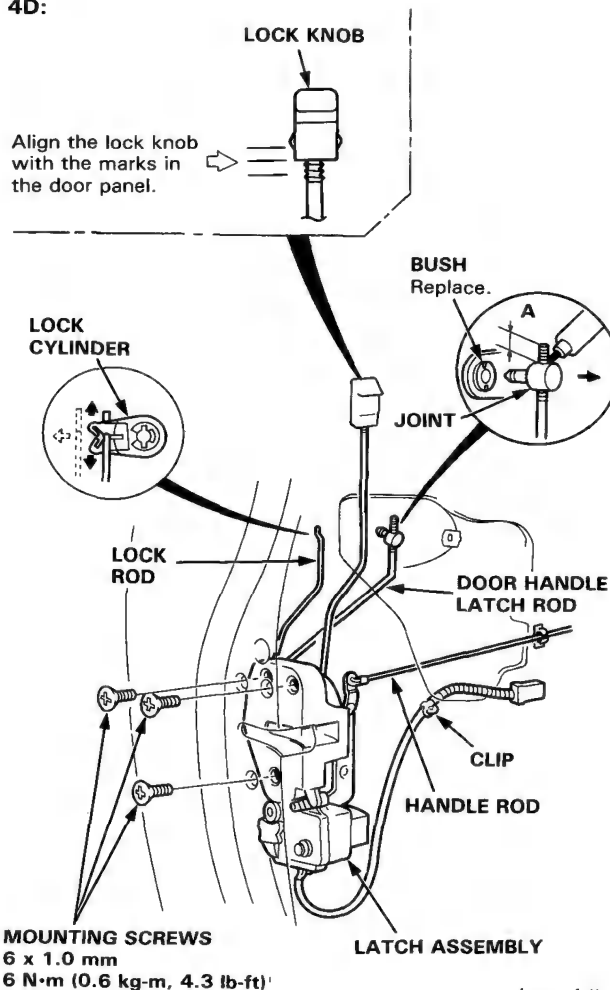
NOTE: Raise the window fully.

1. Remove:
 - Door panel (page 20-4)
 - Plastic cover (page 20-5)
 - Rear channel (page 20-9)
2. Pry the door handle latch rod and lock rod out of its joint using a flat tip screwdriver. Disconnect the connectors from the door. Remove the mounting screws, then remove the latch assembly through the hole in the door.

NOTE:

- Take care not to bend the rods.
- To ease reassembly, note the location A of the rod on the joint before disconnecting it.

4D:

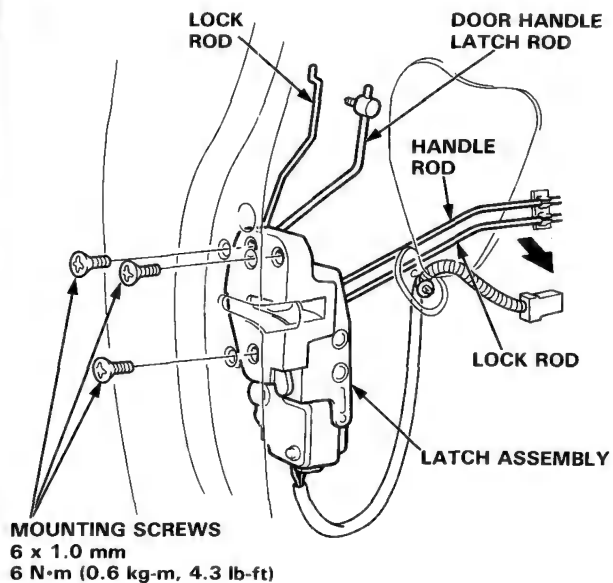


(cont'd)

Front Door

Door Latch Replacement (cont'd)

3D:



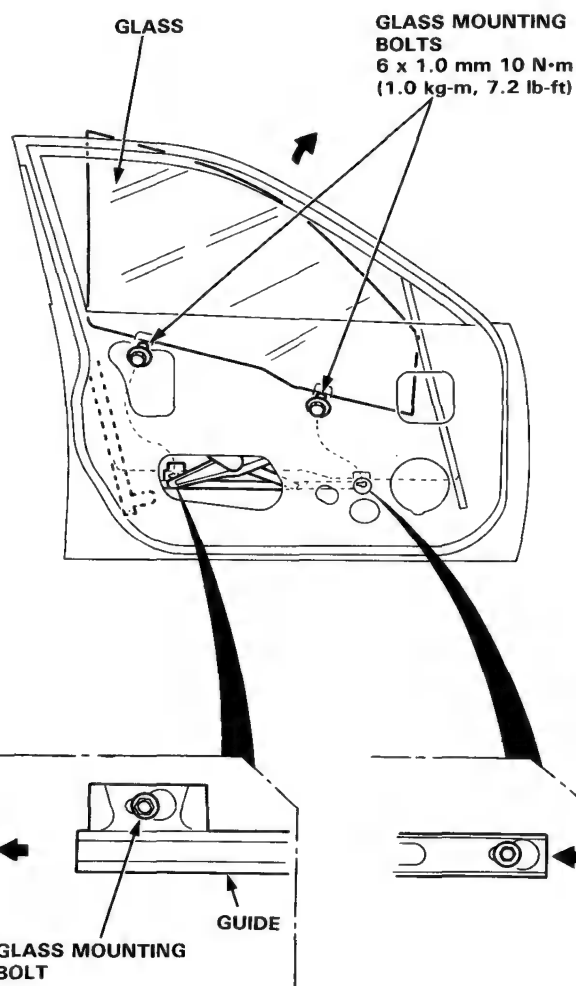
3. Installation is the reverse of the removal procedure.

Glass/Regulator Replacement

1. Remove:
 - Door panel (page 20-4)
 - Plastic cover (page 20-5)
2. Carefully move the window until you can see its mounting bolts, then loosen the bolts. Slide the guide to the rear, then remove the glass.

Carefully pull the glass out through the window slot.

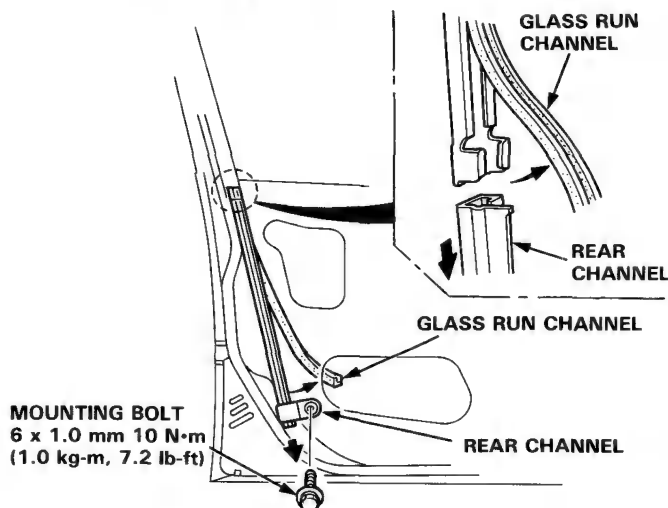
NOTE: Take care not to drop the glass inside the door.



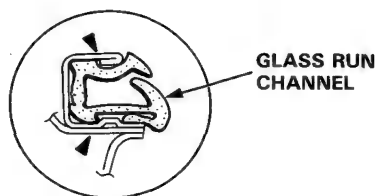


3. Peel the glass run channel out of the channel.
4. Remove the mounting bolt, then remove the rear channel.

NOTE: After installing, make sure the glass run channel is not twisted.



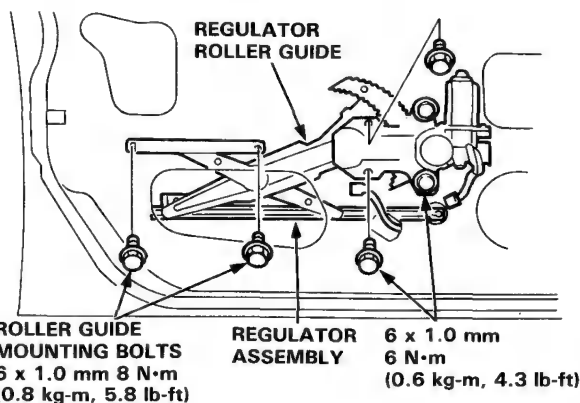
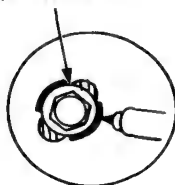
NOTE: To install, fit the glass run channel into the rear channel as shown.



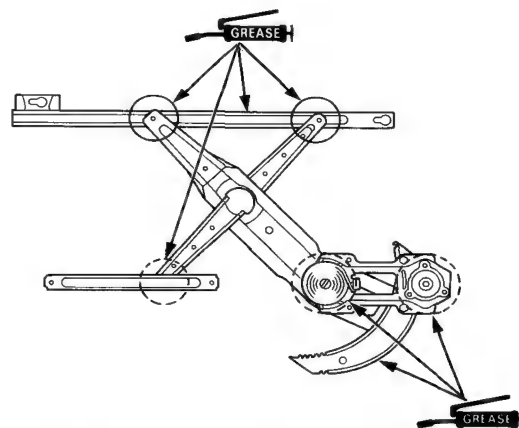
5. Remove the 2 mounting bolts, 2 roller guide bolts and loosen the 2 motor bolts. Disconnect the connector (Power window model). Take out the regulator assembly through the center hole in the door.

NOTE: Scribe a line around the roller guide mounting bolt to show the original adjustment.

ROLLER GUIDE MOUNTING BOLT



6. Grease all the sliding surfaces of the window regulator where shown.
7. Before removing the motor, mark the location by scribing a line across the sector gear and regulator. Install using the 3 mounting bolts. Move the window regulator to the original position by connecting a 12 V battery to the motor (See section 23).



8. Installation is the reverse of the removal procedure.
9. Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and glass run channel when the glass is closed. Adjust the position of the door glass as necessary (page 20-20).
10. Attach the wire harness to the door correctly (page 20-5).
11. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/leaks (page 20-6).

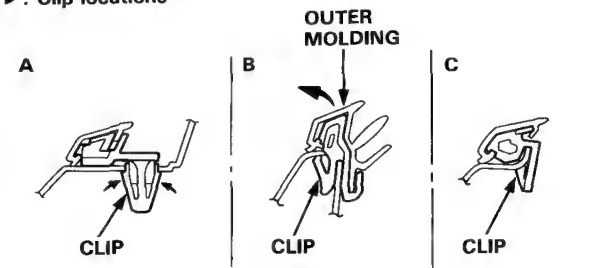
Front Door

Outer Molding Replacement

Remove:

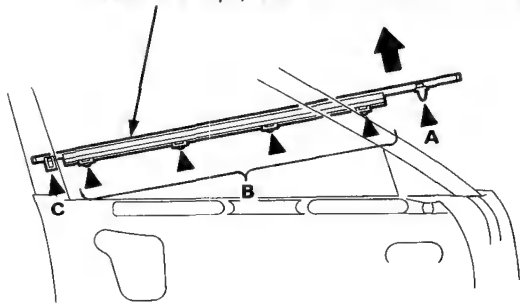
- Door panel (page 20-4)
- Plastic cover (page 20-5)
- Door mirror (page 20-23)
- Glass (page 20-8)
- Sash trim

► : Clip locations

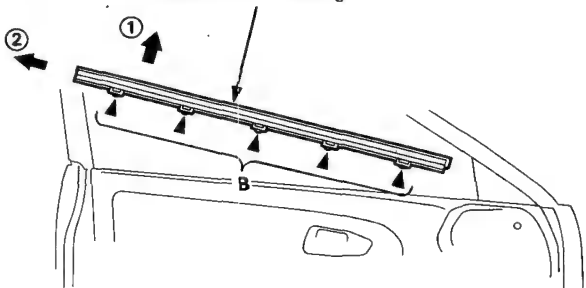


NOTE: Take care not to twist or scratch the molding.

4D: **OUTER MOLDING**
Starting at the front, pry the molding up and detach the clips, then remove the outer molding.



3D: **OUTER MOLDING**
① Starting at the rear, pry the molding up and detach the clips.
② Slide the molding to the rear, then remove the molding.



Installation is the reverse of the removal procedure.

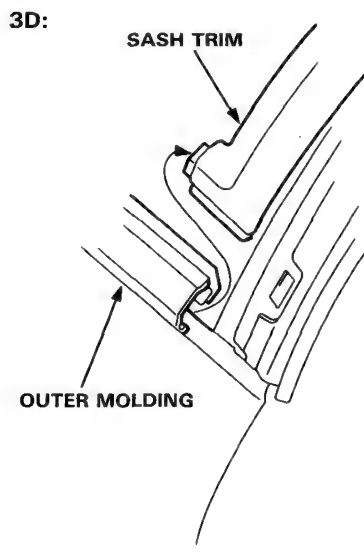
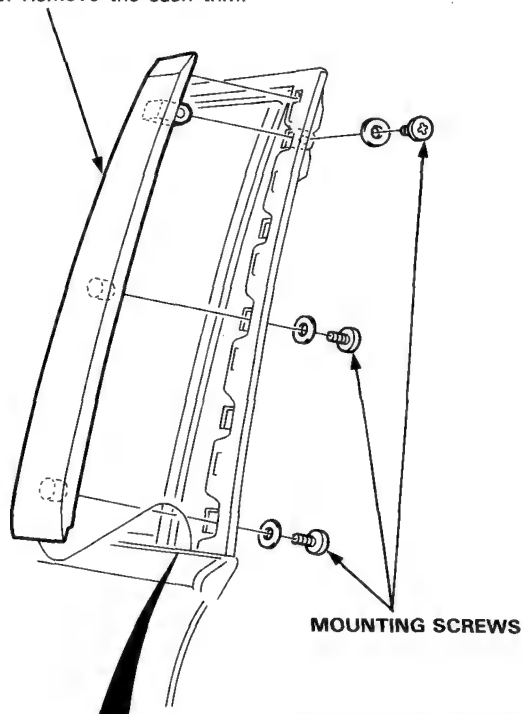
NOTE: If necessary, replace any damaged clips.

Sash Trim Replacement

NOTE: Take care not to scratch the sash trim.

SASH TRIM

Peel the outer weatherstrip out, then remove the mounting screws. Remove the sash trim.



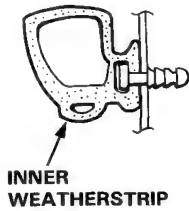
Installation is the reverse of the removal procedure.



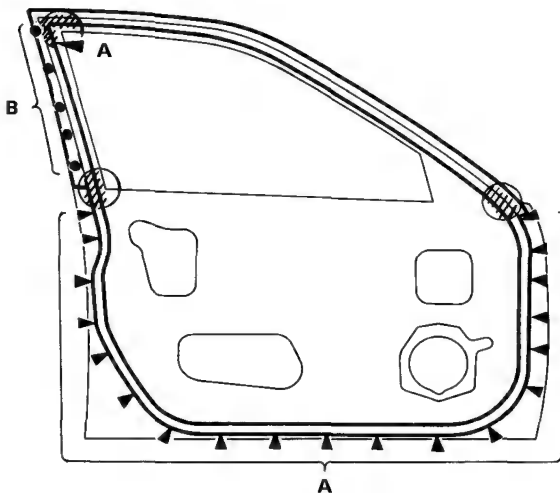
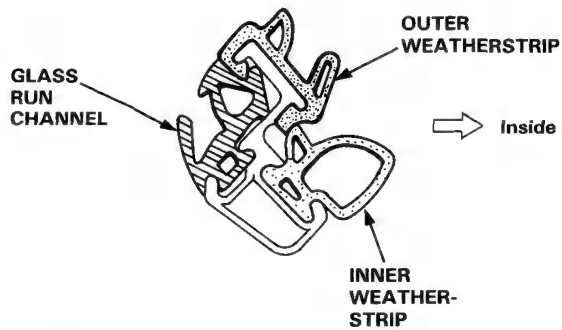
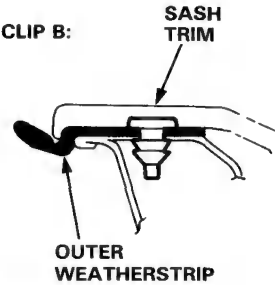
Weatherstrip Replacement

►, ●: Clip locations

CLIP A:



CLIP B:



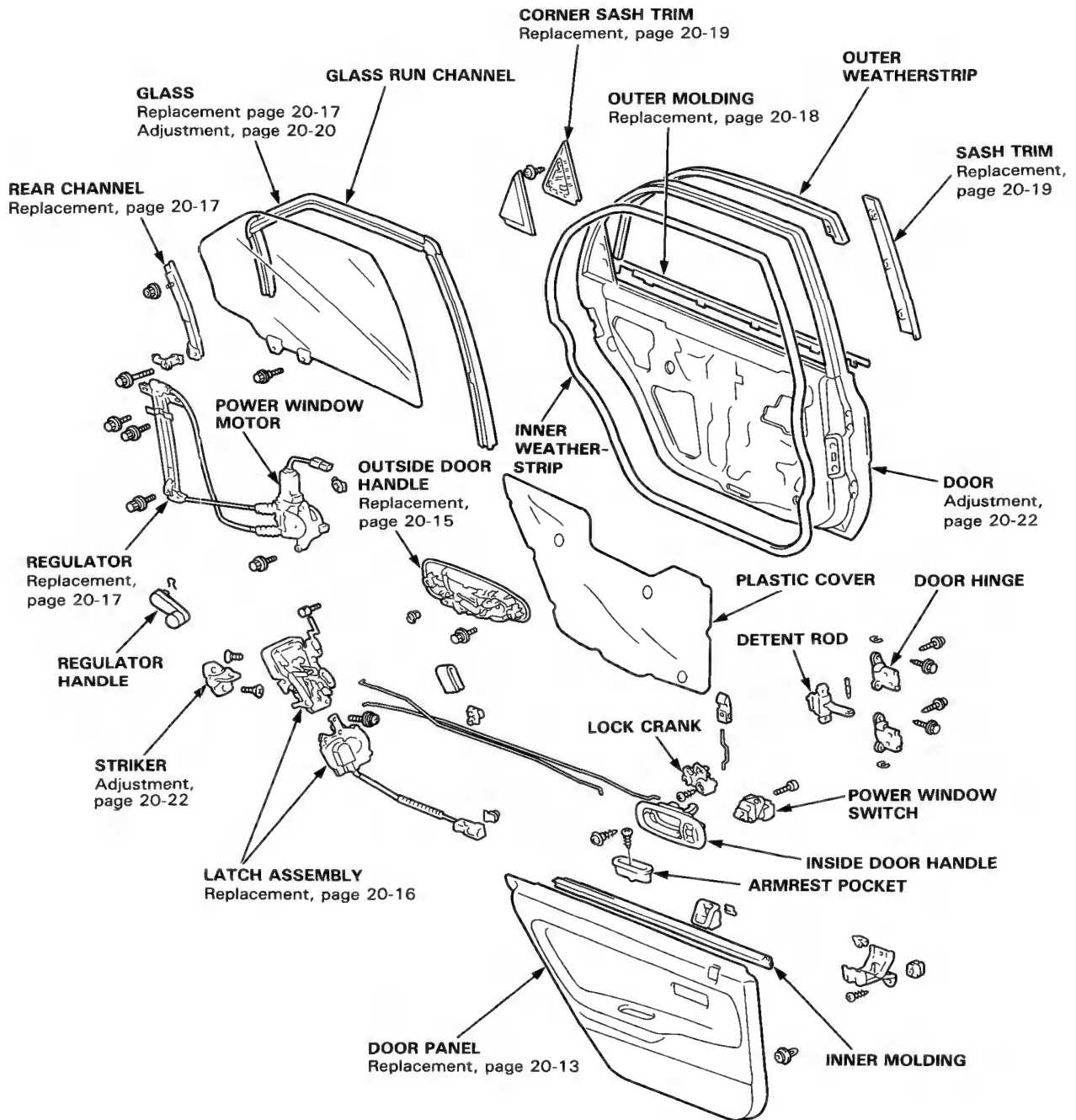
NOTE:

- Before installing the weatherstrip, apply clear sealant to the shadowed areas of the door as shown.
- If necessary, replace any damaged clips.

Sealant: cemedine #8500

Rear Door

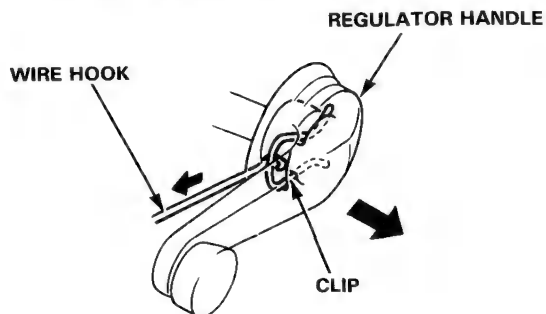
Index



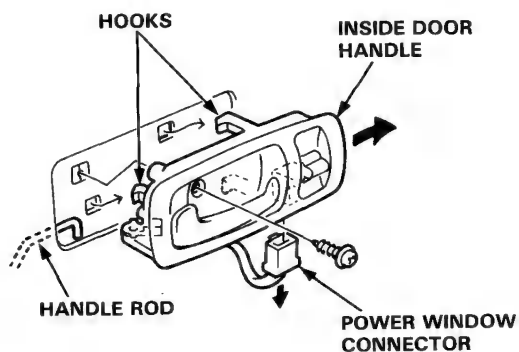


Doors Panel/Plastic Cover Replacement

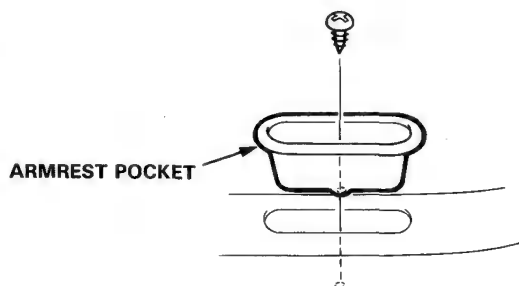
1. If applicable, remove the regulator handle by pulling the clip out with a wire hook.



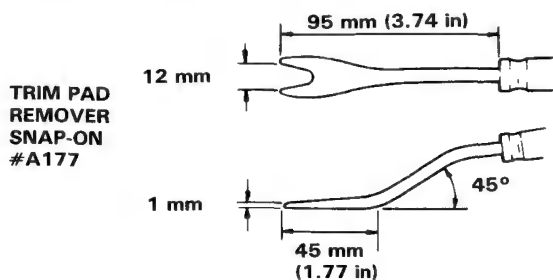
2. Remove the mounting screw, then pull the inside door handle out half-way and disconnect the handle rod and connector.



3. Remove the mounting screw, then remove the armrest pocket.

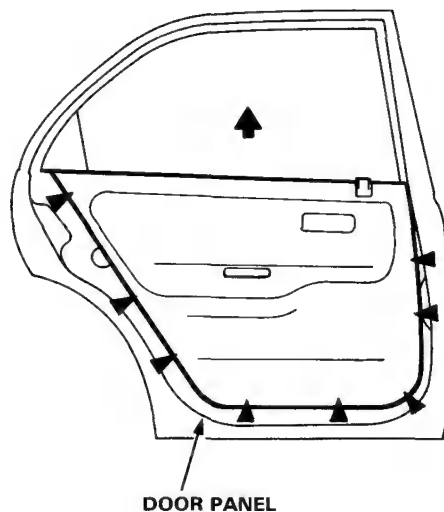
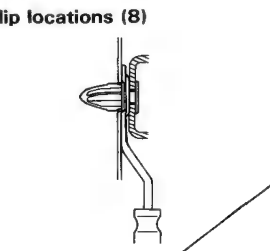


NOTE: Remove the panel with as little bending as possible to avoid creasing or breaking it.



4. Remove the clips attaching the door panel (See trim pad remover). Remove the door panel by pulling it upward.

►: Clip locations (8)

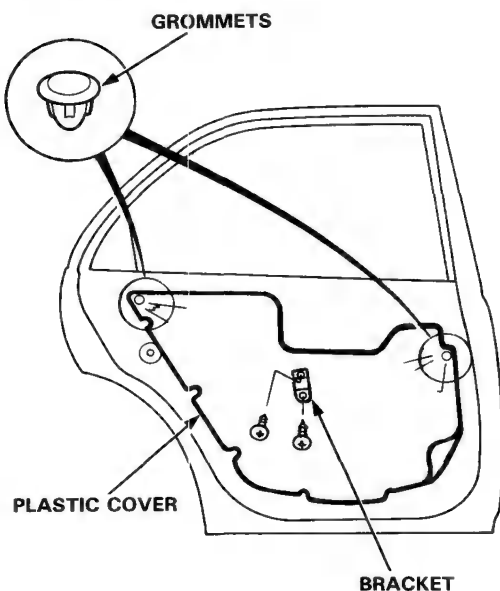


(cont'd)

Rear Door

Plastic Cover Replacement (cont'd)

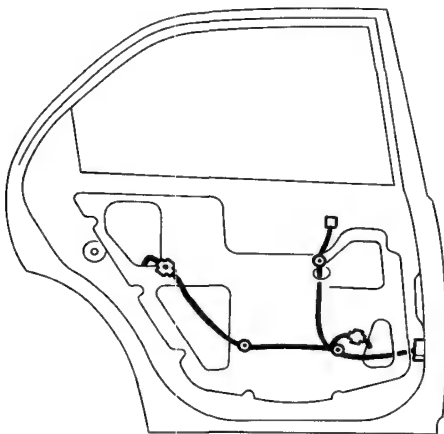
5. Remove the grommets and bracket, then carefully remove the plastic cover.



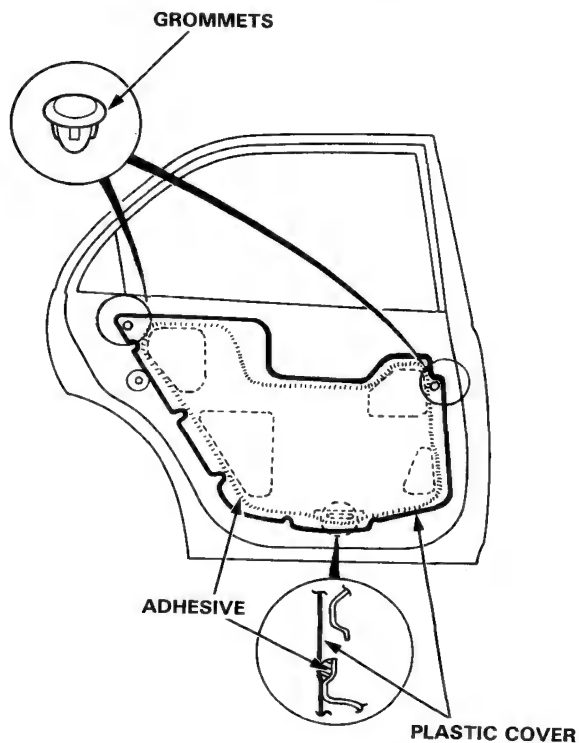
6. Install the door panel and plastic cover in the reverse order of removal.

NOTE: Make sure the wire harnesses and connectors are fastened correctly on the door.

►: Harness clip locations



- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/water leaks.



- Before tightening the door panel mounting screws, make sure the wire harnesses are not pinched.



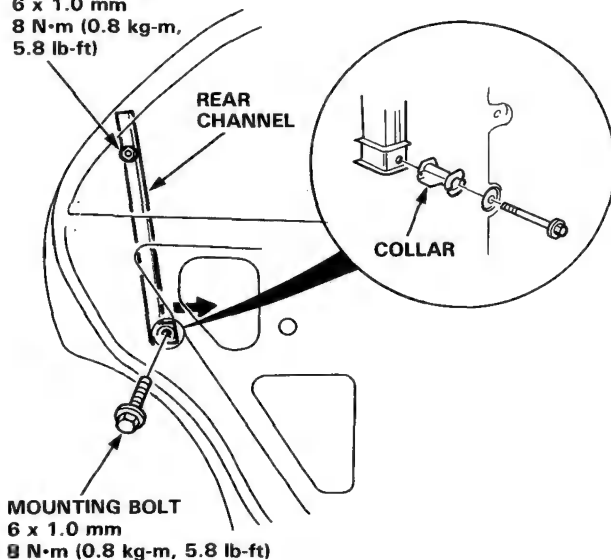
Outside Door Handle Replacement

NOTE: Raise the window fully.

1. Remove:
 - Door panel (page 20-13)
 - Plastic cover (page 20-14)
 - Corner sash trim (page 20-19)
2. Loosen the mounting nut and remove the mounting bolt, then move the rear channel forward.

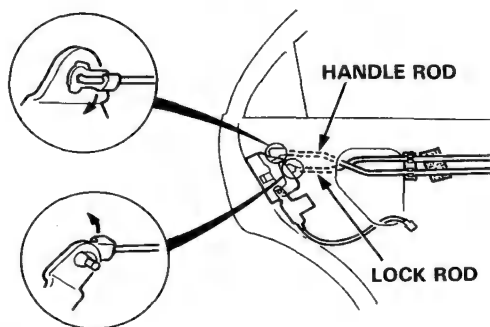
MOUNTING NUT

6 x 1.0 mm
8 N·m (0.8 kg-m,
5.8 lb-ft)



3. Disconnect the handle rod and lock rod from the latch.

NOTE: Take care not to bend the rods.

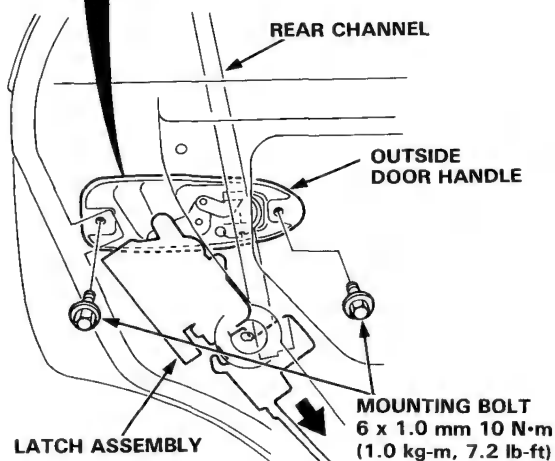
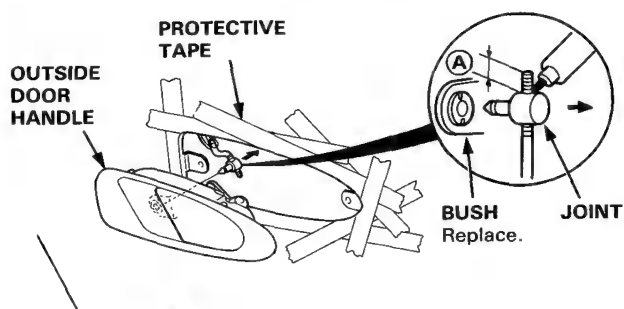


4. Remove the mounting screws, then slide the latch assembly down until you can see the outside door handle mounting bolt (page 20-16).

5. Remove the mounting bolts, then pull out the outside door handle.
Pry the door handle latch rod out of its joint using a flat tip screwdriver.

NOTE:

- Use protective tape around the outside door handle to prevent damage.
- To ease reassembly, note the location (A) of the rod on the joint before disconnecting it.



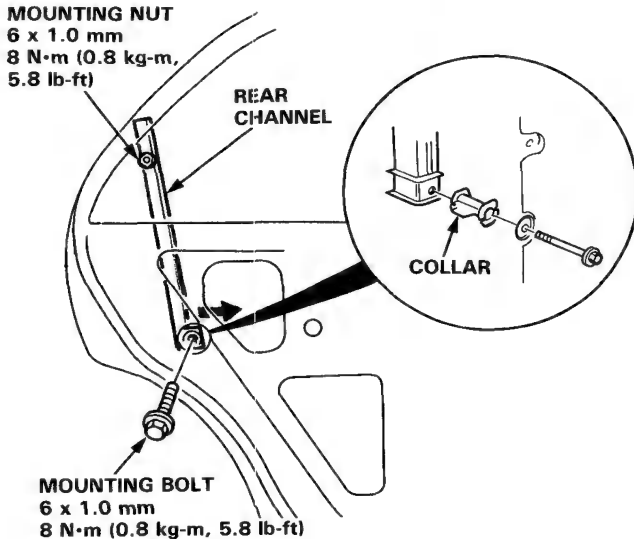
6. Installation is the reverse of the removal procedure.

Rear Door

Door Latch Replacement

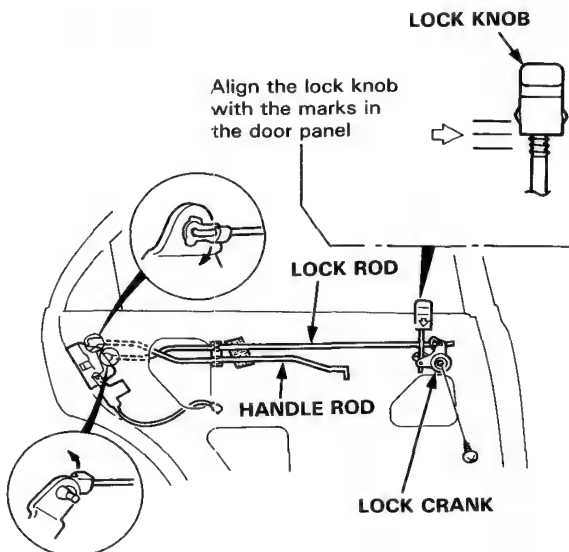
NOTE: Raise the window fully.

1. Remove:
 - Door panel (page 20-13)
 - Plastic cover (page 20-14)
 - Corner sash trim (page 20-19)
2. Loosen the mounting nut and remove the mounting bolt, then move the rear channel forward.



3. Disconnect the handle rod and lock rod from the latch.
Remove the mounting screw and detach the lock rod and handle rod, then remove the lock crank.

NOTE: Take care not to bend the rods.

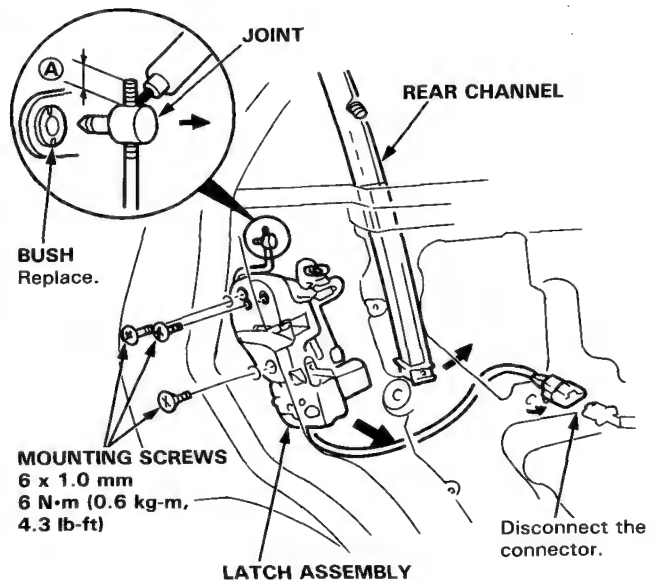


4. Remove the mounting screws, then slide the latch assembly down until you can see the outside door handle mounting bolt.
5. Remove the mounting bolts, then pull out the outside door handle (page 20-15).
Pry the door handle latch rod out of its joint using a flat tip screwdriver.

NOTE:

- Use protective tape around the outside door handle to prevent damage.
- To ease reassembly, note the location (A) of the rod on the joint before disconnecting it.

6. Remove the latch assembly through the hole in the door. Disconnect the connector.



7. Installation is the reverse of the removal procedure.

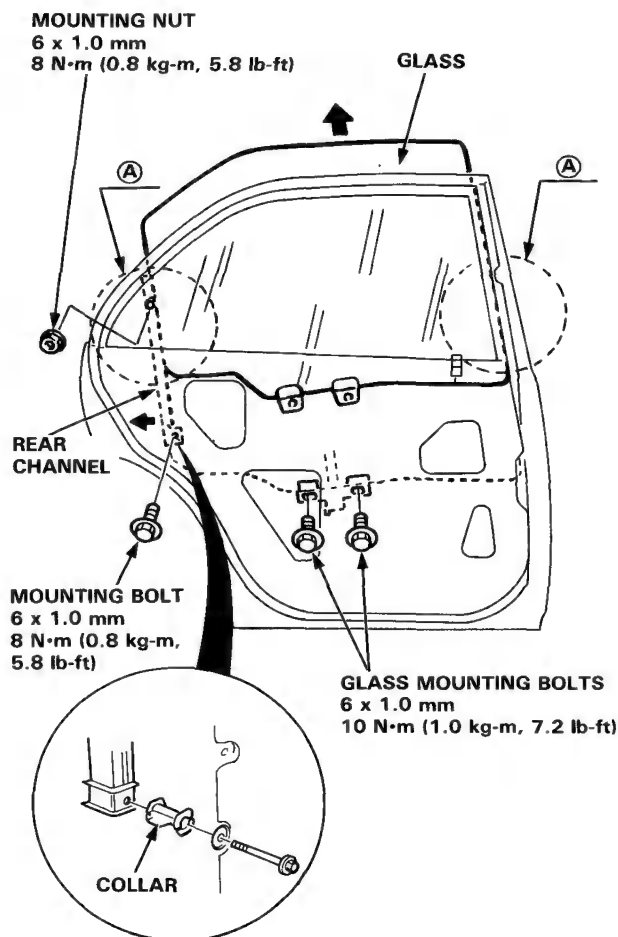


Glass/Regulator Replacement

1. Remove:
 - Door panel (page 20-13)
 - Plastic cover (page 20-14)
 - Corner sash trim (page 20-19)
2. Remove the rear channel mounting nut and bolt.
3. Carefully move the window until you can see its mounting bolts, then remove the bolts. Carefully pull the glass out through the window slot.

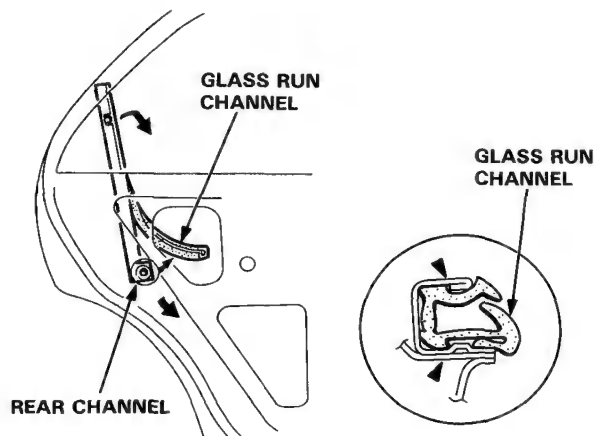
NOTE:

- Take care not to drop the glass inside the door.
- Take care not to damage the location (A) of the glass run channel.



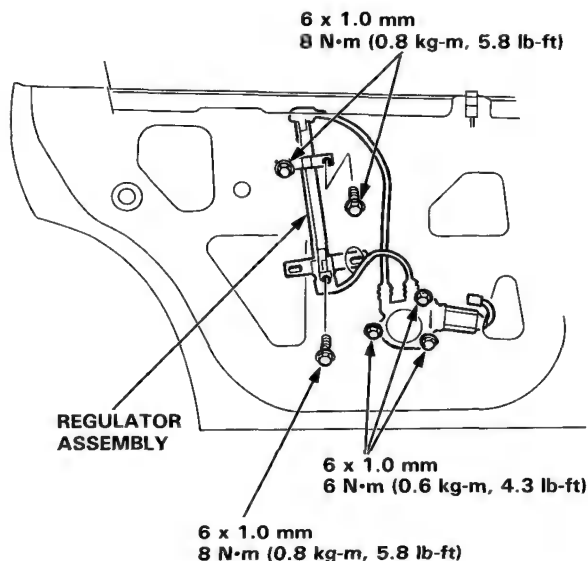
4. Peel the glass run channel out of the channel, then remove the rear channel.

NOTE: After installing, make sure the glass run channel is not twisted.



NOTE: To install, fit the glass run channel into the rear channel as shown.

5. Remove the 2 mounting bolts. Loosen the upper mounting bolt and 3 motor bolts. Disconnect the connector (Power window model). Remove the regulator assembly through the center hole in the door.

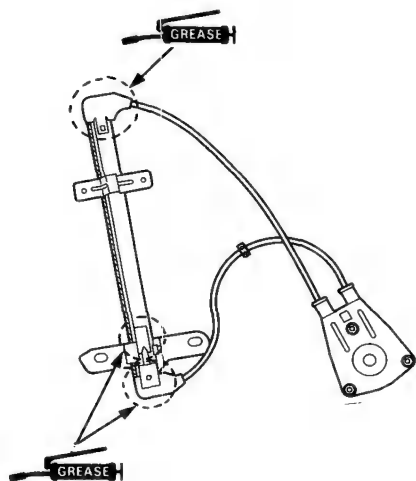


(cont'd)

Rear Door

Glass/Regulator Replacement (cont'd)

6. Grease all the sliding surfaces of the window regulator where shown.
7. Before removing the motor, mark the location by scribing a line across the sector gear and regulator. Install using the 3 mounting bolts. Move the window regulator to the original position by connecting a 12 V battery to the motor (see Section 23).



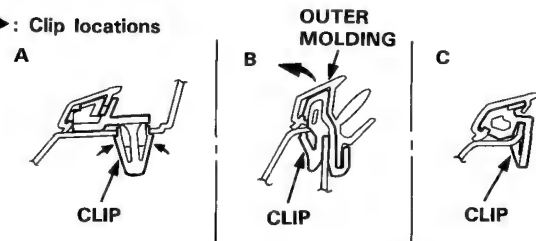
8. Installation is the reverse of the removal procedure.
9. Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and glass run channel when the glass is closed. Adjust the position of the door glass as necessary (page 20-20).
10. Attach the wire harness to the door correctly (page 20-14).
11. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/water leaks (page 20-14).

Outer Molding Replacement

Remove:

- Door panel (page 20-13)
- Plastic cover (page 20-14)
- Glass (page 20-17)
- Sash trim (page 20-19)

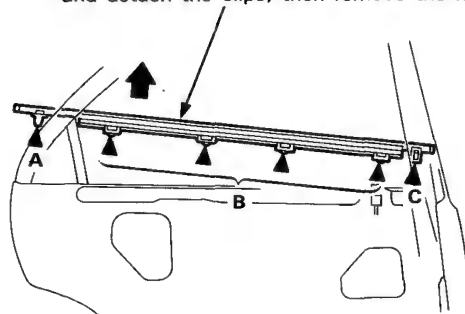
►: Clip locations



NOTE: Take care not to twist or scratch the molding.

OUTER MOLDING

Starting at the rear, pry the molding up and detach the clips, then remove the molding.



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

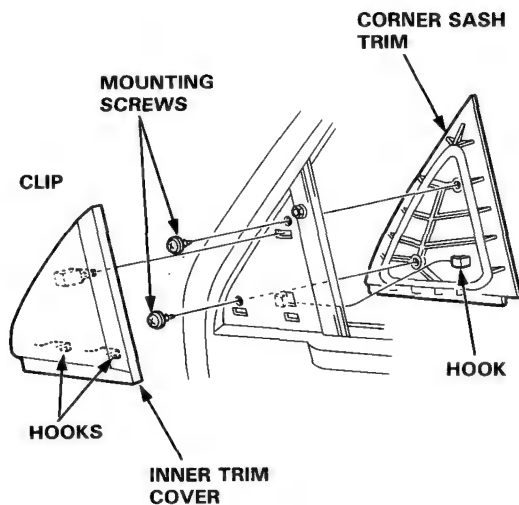
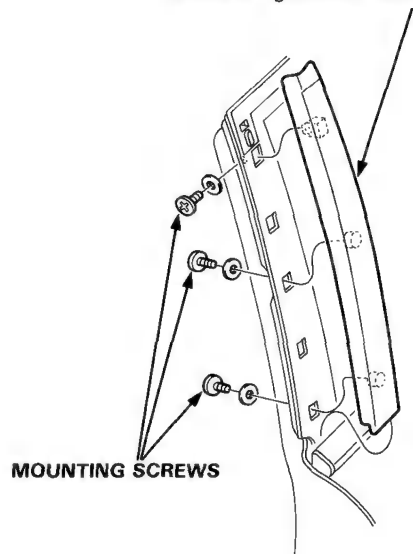


Sash Trim Replacement

NOTE: Take care not to scratch the sash trim.

SASH TRIM

Peel the outer weatherstrip out, then remove the mounting screws. Remove the sash trim.

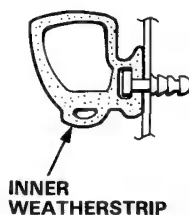


Installation is the reverse of the removal procedure.

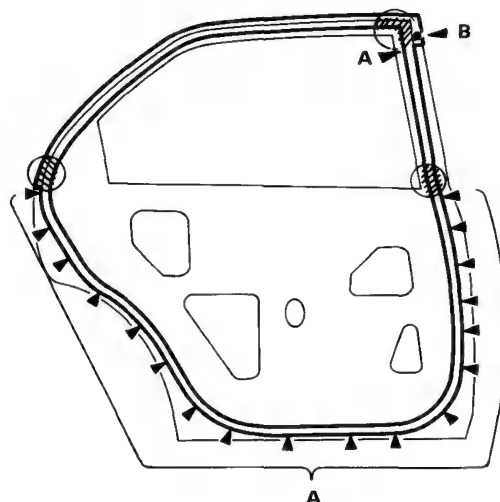
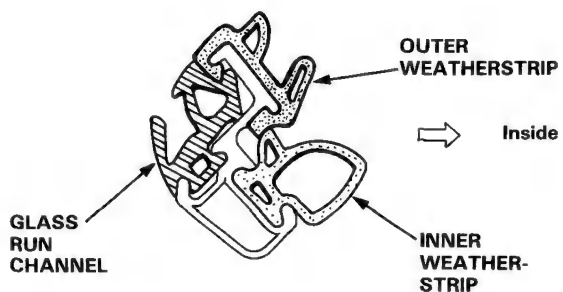
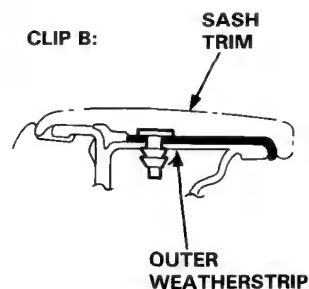
Weatherstrip Replacement

►, ●: Clip locations

CLIP A:



CLIP B:



Sealant: Cemedine #8500

NOTE:

- Before installing the weatherstrip, apply clear sealant to the shadowed areas of the door as shown.
- If necessary, replace any damaged clips.

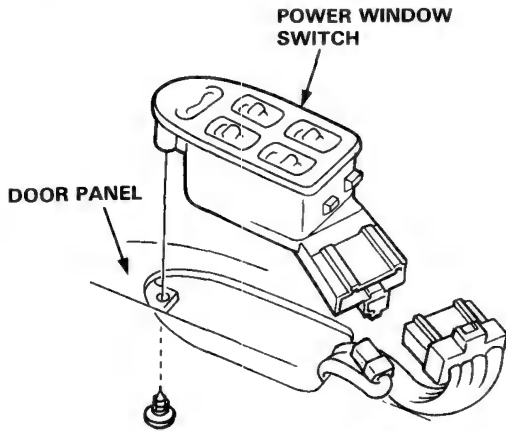
Doors

Glass Adjustment

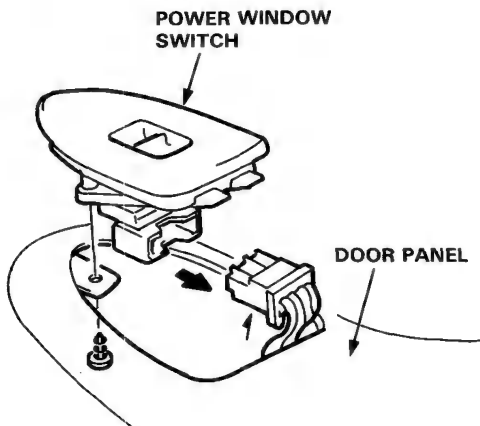
NOTE:

- Place the vehicle on a firm, level surface when adjusting the doors or glass.
 - Check the weatherstrip and glass run channel for damage or deterioration and replace if necessary.
1. Remove the door panel and peel off the plastic cover (pages 20-4, 5, 13, 14).
 2. Remove the power window switch from the door panel (Power window model).

Driver's:



Passenger's:

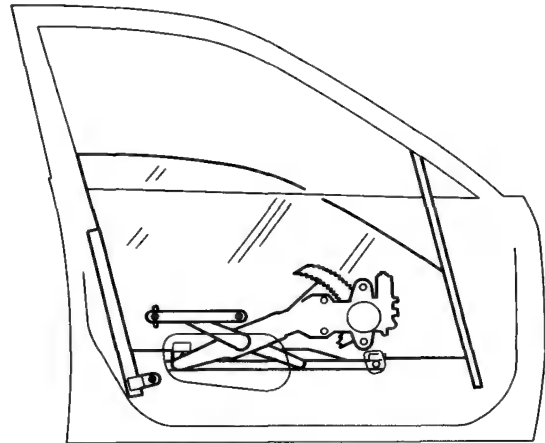


4D Rear: See page 20-13
3D: See page 20-4

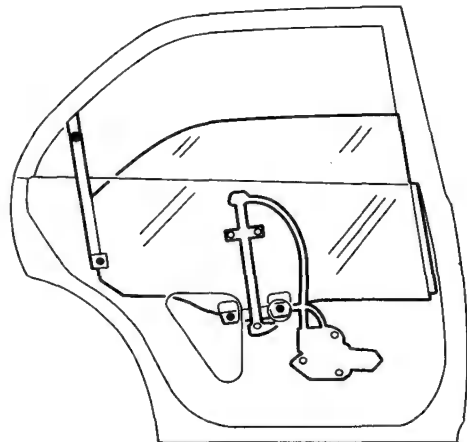
3. Connect the power window switch connector to the door harness (Power window model).
Install the regulator handle on the door regulator (Manual window model).

4. To adjust glass fit in the door, raise the glass as far up as possible and hold it against the door sash. Then tighten the roller guide bolts (4D front/3D) and glass mounting bolts (4D rear).
Check for smooth movement of the door glass.

4D Front/3D:



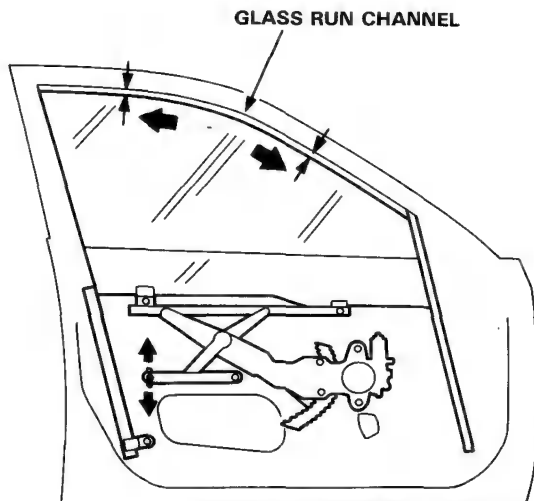
4D Rear:



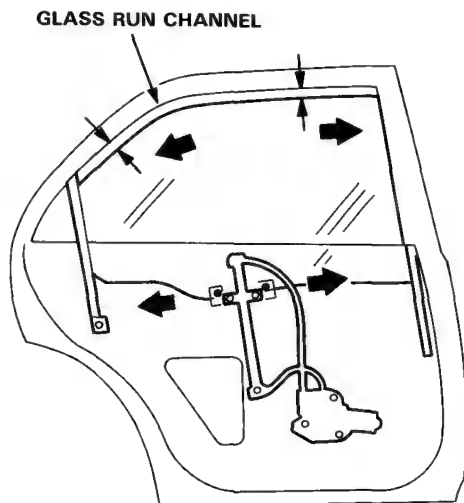


5. If necessary, loosen the roller guide bolt (4D front/3D) and glass mounting bolts (4D rear) and adjust the window glass so it is parallel with the glass run channel.

4D Front/3D:



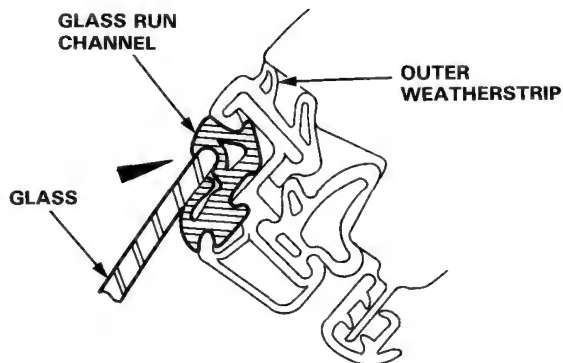
4D Rear:



6. Raise the window glass fully and check gap.

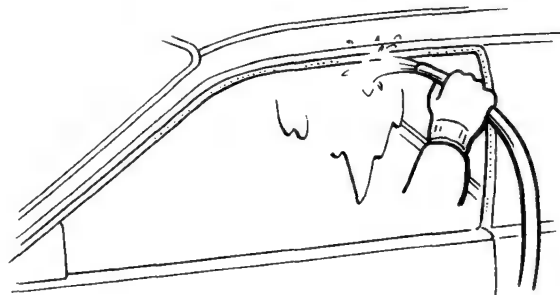
7. Check window operation.

NOTE: Check that the glass run channel is not pinched by the glass.



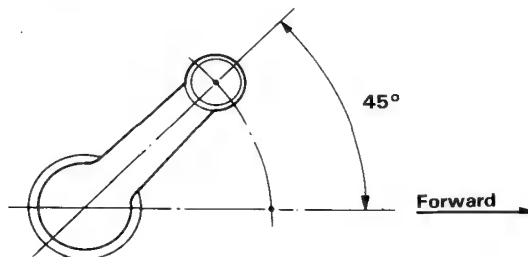
8. With the door and glass closed fully, check for water leaks.

NOTE: Do not use high pressure water.



9. Route the wire harness and connectors and fasten them to the door. (pages 20-5, 14).

10. Attach the plastic cover, then install the door panel (pages 20-4, 5, 13, 14).



11. Install the regulator handle so it points forward and up at a 45 degree angle with the window closed.

12. Check for air leaks.

Doors

Door Position Adjustment

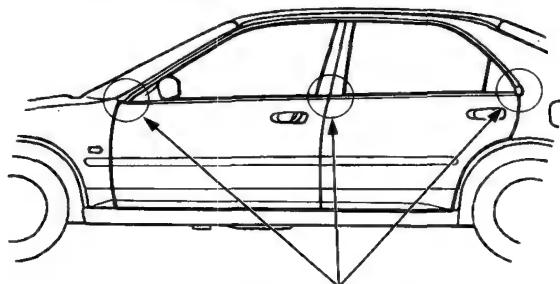
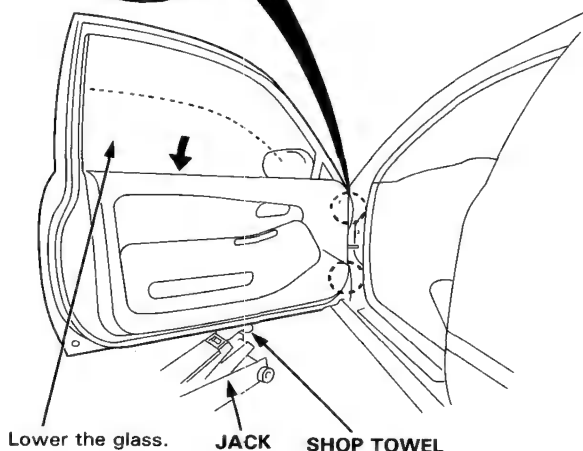
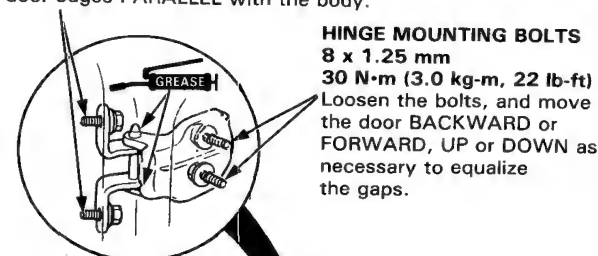
After installing the door, check for a flush fit with the body, then check for equal gap between the front and rear, and top and bottom door edges and the body. The door and body edges should also be parallel. Adjust at the hinges as shown.

CAUTION: Place a shop towel on the jack to prevent damage to the door when the hinge bolts are loosened for adjustment.

DOOR MOUNTING BOLTS

8 x 1.25 mm 30 N·m (3.0 kg-m, 22 lb-ft)

Loosen the bolts slightly to move the door IN or OUT until it's flush with the body. If necessary, you can install a shim behind one hinge to make the door edges PARALLEL with the body.



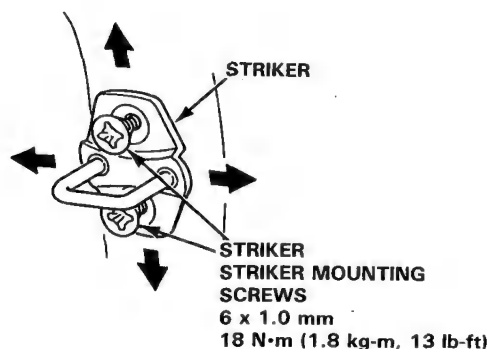
The door and body edges should be parallel.

NOTE: Check for water and air leaks.

Door Striker Adjustment

Make sure the door latches securely without slamming. If it needs adjustment:

1. Draw a line around the striker plate for reference.
2. Loosen the striker screws and move the striker IN or OUT to make the latch fit tighter or looser. Move the striker UP or DOWN to align it with the latch opening. Then lightly tighten the screws and recheck.



NOTE: Hold the outside handle out and push the door against the body to be sure the striker allows a flush fit.

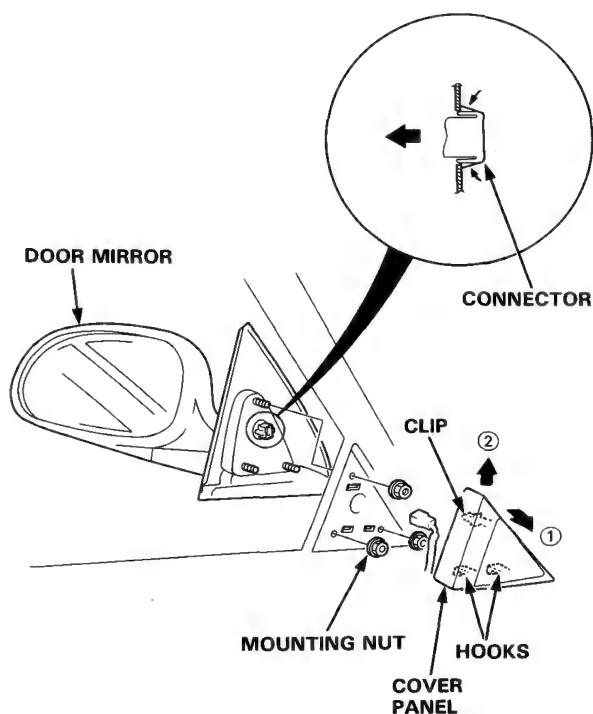
3. If the door latches properly, tighten the screws and recheck.



Power Door Mirrors

Removal

1. Pry out the cover panel with a flat tip screwdriver, then remove the cover panel. Disconnect the power mirror connector.
2. Remove the mirror mounting nuts while holding the mirror.

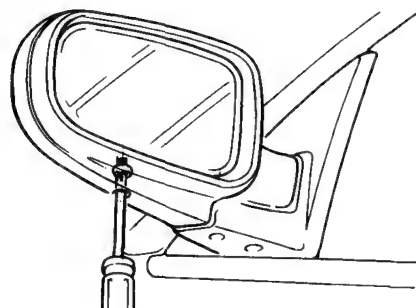


3. Install the door mirror in the reverse order of the removal procedure.
4. With the door and door glass closed fully, check for water and air leaks.

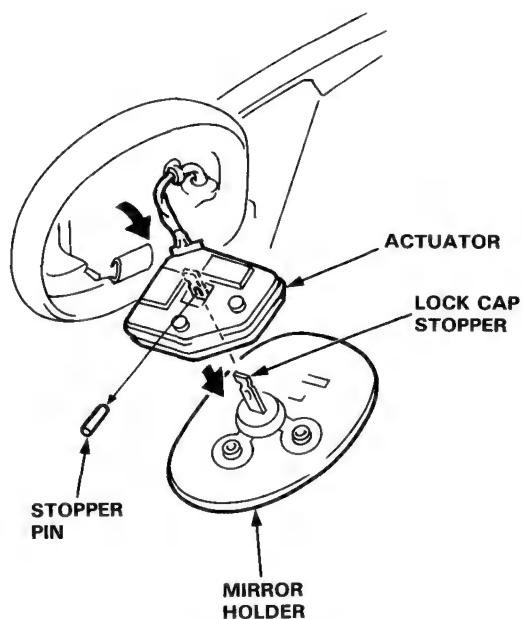
NOTE: Do not use high pressure water.

Mirror Glass Replacement

1. Insert a screwdriver in the mirror through the service hole, and loosen the actuator retaining screw.



2. Pull the actuator out from the mirror housing.
3. Pull the lock cap stopper and remove the stopper pin, then separate the actuator and mirror holder.

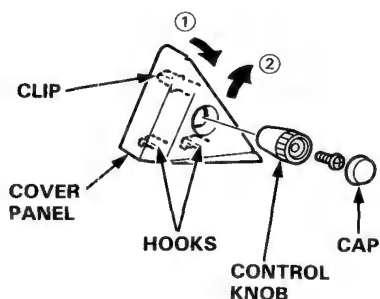
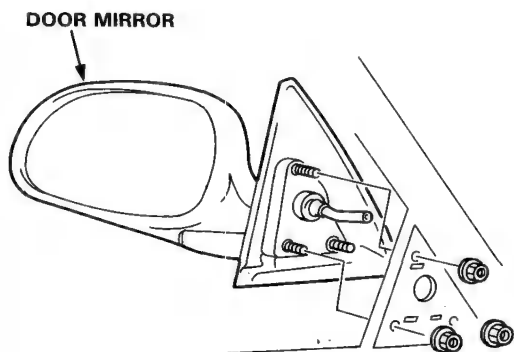


4. Install the mirror in the reverse order of the removal procedure and apply grease to the locations indicated by the arrows.

Manual Door Mirrors

Removal

1. Remove the cap and the screw, then remove the control knob.
2. Remove the cover panel.
3. Remove the mirror mounting nuts while holding the mirror.



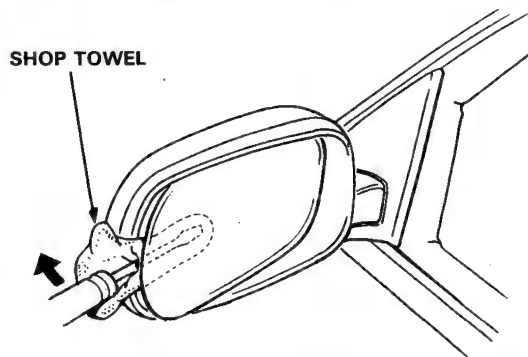
4. Install the door mirror in the reverse order of the removal procedure.
5. With the door and door glass closed fully, check for water and air leaks.

NOTE: Do not use high pressure water.

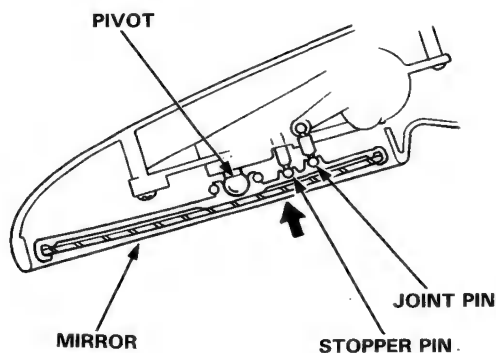
Mirror Glass Replacement

1. Carefully pry out the mirror with a flat tip screwdriver as shown.

CAUTION: To prevent damage to the mirror, wrap the end of the screwdriver with a shop towel.



2. Install the mirror in the reverse order of the removal procedure and apply grease to the location indicated by the arrow.

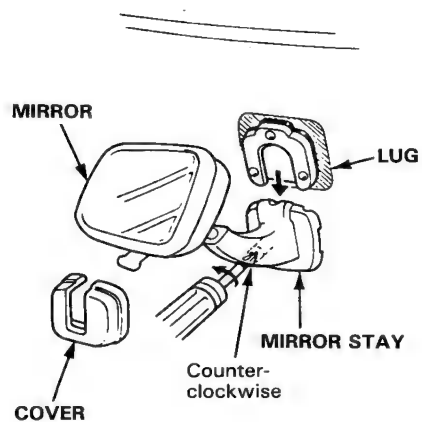




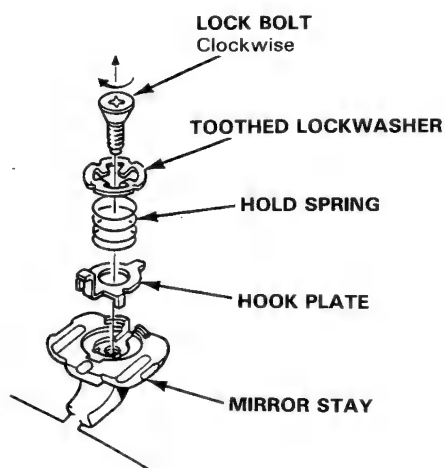
Rearview Mirror

Replacement

1. Carefully remove the cover with a flat tip screwdriver.
2. Loosen the lock bolt, then slide the mirror stay from the lug.



3. Remove the lock bolt, then remove the toothed lock washer and hold spring from the mirror stay.

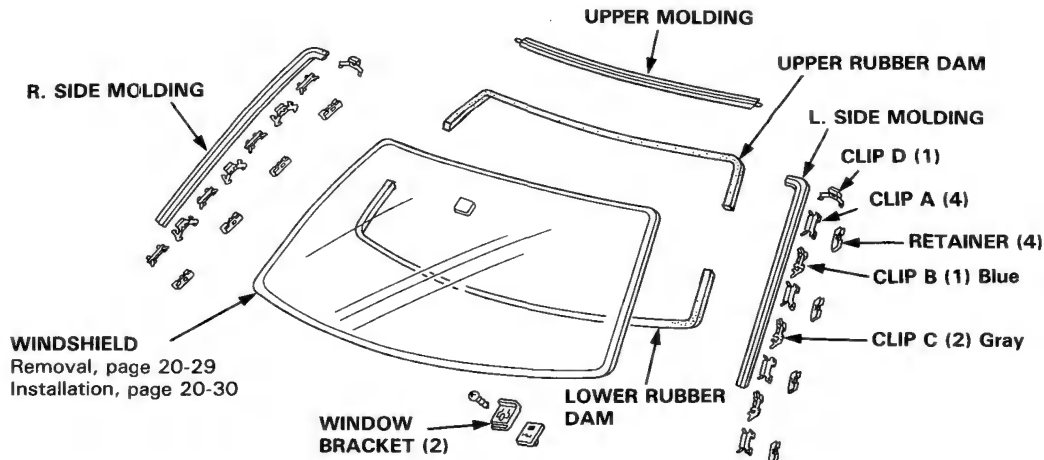


4. Installation is the reverse of the removal procedure.

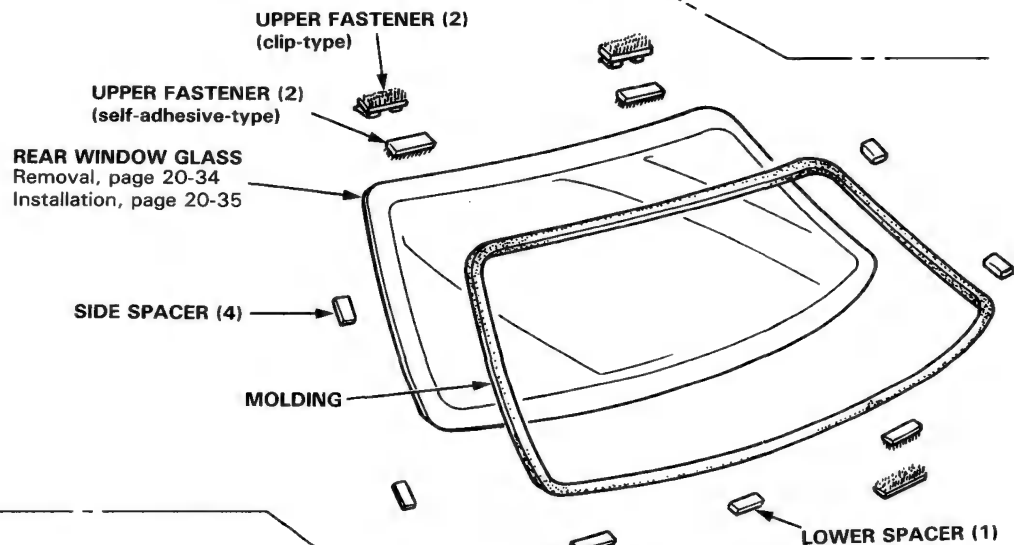
Windshield, Rear Window Glass, Quarter Glass

Index

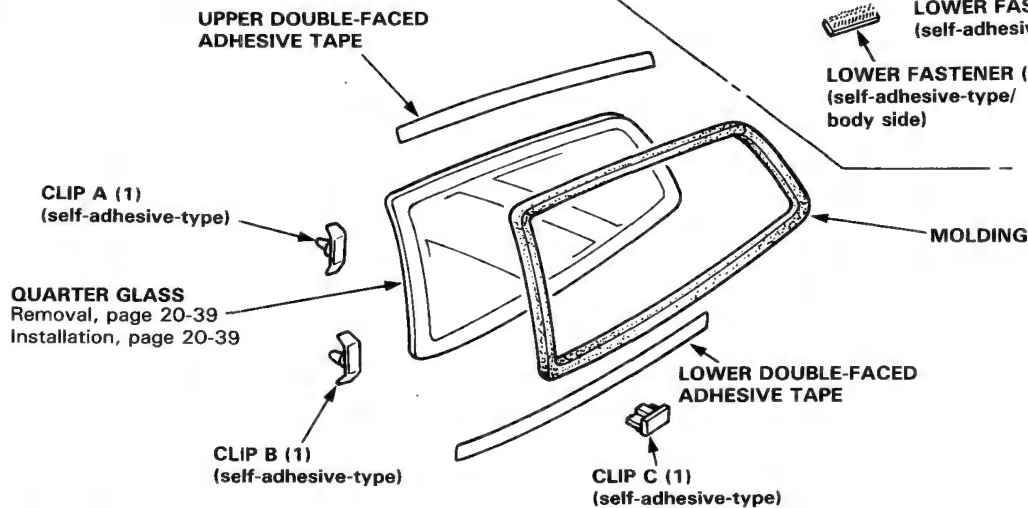
3D/4D:



4D:



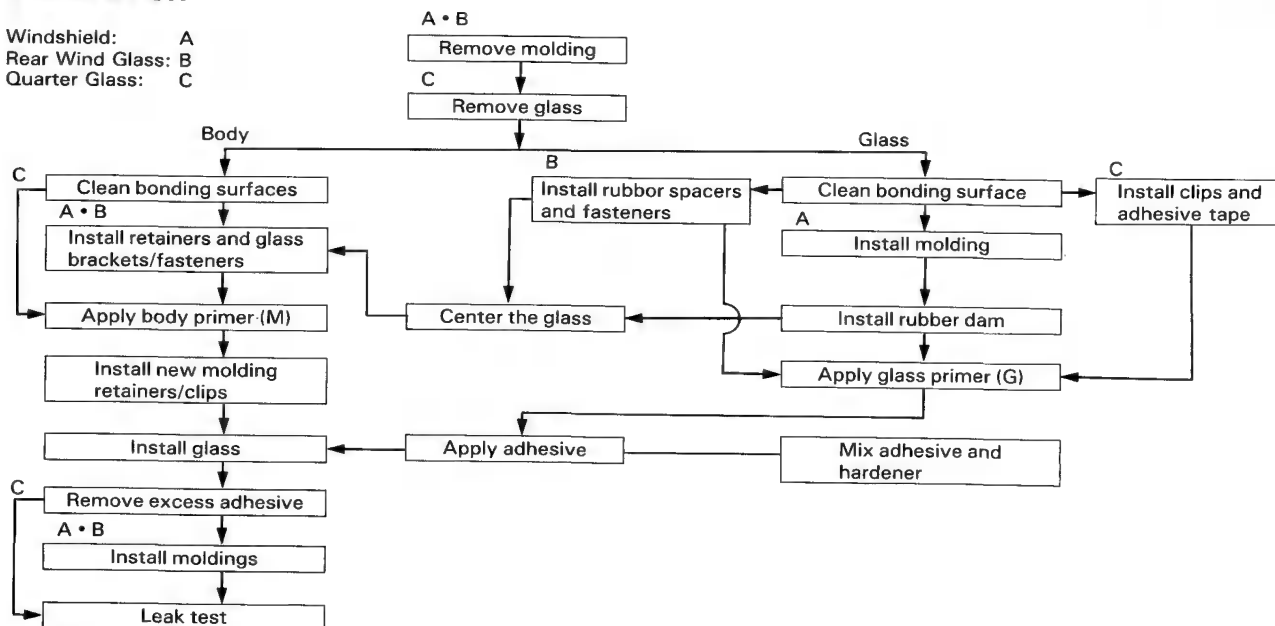
3D:





Installation

Windshield: A
Rear Wind Glass: B
Quarter Glass: C



Parts

Part Number	Contents	Comment
Adhesive kit — Low temperature 08718—99960 High temperature 08718—99961	{ Adhesive sealant (500 g) { Hardener (75 g) { Glass primer G (20 g) { Body primer M (20 g) { Piano wire (0.6 ø x 1 m (3f)) { Gauze { Cartridge { Sponge	For glass primer (G) For applying primers

NOTE:

- Both kits have two types of adhesive primer: one for the body (metal), and one for glass.
- Always use new genuine Honda adhesive, or equivalent.
- Do not use the adhesive if 6 months have elapsed since date of manufacture.
- Store adhesive in a cool, dry place.
- Open only immediately before you are going to use it.

Tools

Tool/Material	Remarks
Glass or steel plate Putty knife Caulking gun Suction cups	To mix adhesive and hardener on To mix adhesive and remove excess To apply bead of adhesive to windshield To install windshield
Knife Awl Two wood sticks Toluene or alcohol	To scrape bonding surface around window opening To make hole through existing adhesive for piano wire To hold piano wire To clean bonding surfaces

Windshield, Rear Window Glass, Quarter Glass

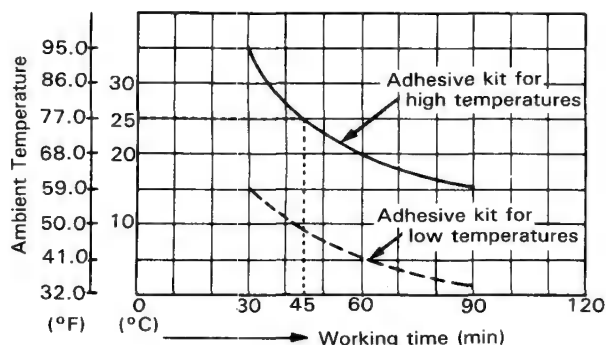
Workable Time

Adhesive workable time varies widely according to temperature, so choose the correct adhesive kit for the temperature range you will be working in.

After mixing and applying adhesive, you should install the windshield within the time shown on the chart.

For example, when the ambient temperature is 25°C (77°F), the glass should be installed within 45 minutes using the high temperature type adhesive.

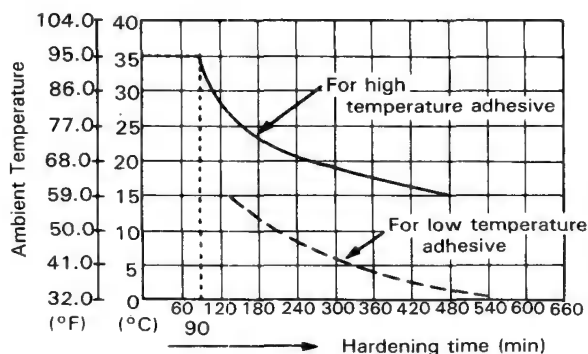
Kit part numbers and contents are listed on the page before.



Hardening Time

Hardening time can be shortened by heating with infrared light.

For example, the adhesive will start to harden within 270 minutes mixing at 20°C (63°F). If however, it is heated to 35°C (95°F), it will start to harden within 90 minutes.

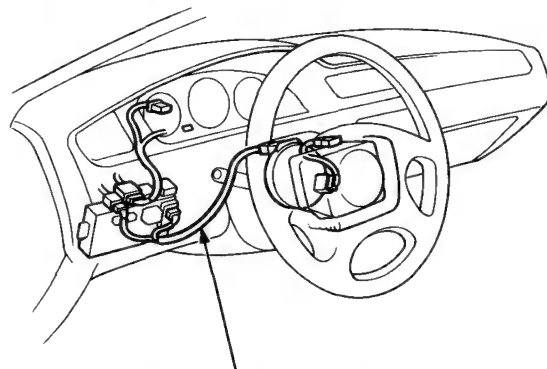


Broken Glass Removal

SRS wire harnesses are routed near the dashboard and steering column.

CAUTION: with SRS

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire effected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

Remove as much broken glass as possible with a vacuum cleaner.

Blow out the glass in the heater and behind the dashboard with low pressure compressed air:

⚠ WARNING Wear eye protection while using the air gun.

1. Set the temperature control lever to COLD.
2. Push the HEAT button on the function pawel.
3. Make sure the recirculation button is OFF.
4. Blow compressed air throught the defroster center vent outlet.
5. Remove the blower duct, and remove any glass from the air mix chamber.
6. Remove the any glass from the top of the vent/defrost door.
7. Remove any glass from top and bottom of carpet and seats with a vacuum cleaner.

NOTE: It is recommended to remove the seats to shake off any glass (page 20-64).

Windshield



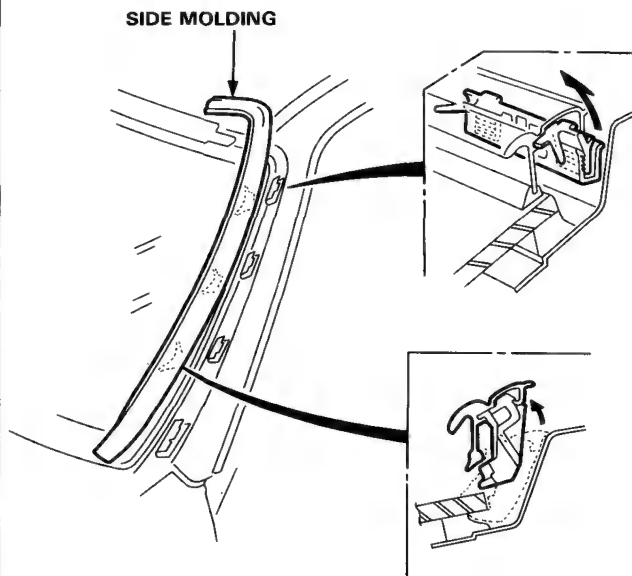
Removal

CAUTION:

- Wear gloves to remove and install the glass.
- Use seat covers to avoid damaging any surfaces.

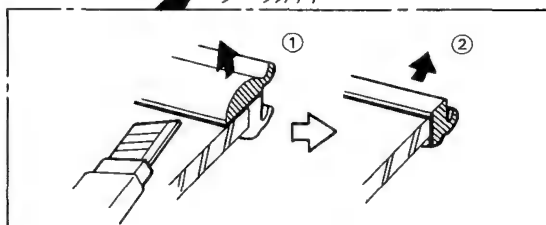
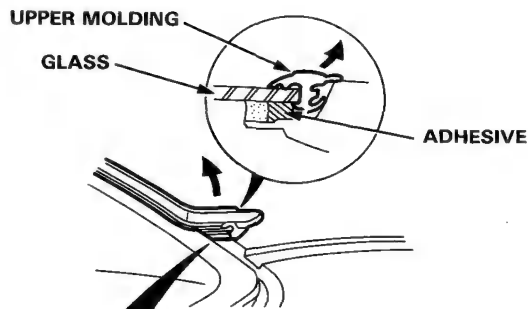
1. To remove the windshield, first remove the:
 - Rearview mirror (page 20-25)
 - Sunvisors, center visor (page 20-60)
 - Front pillar trim (pages 20-61, 62, 63)
 - Front wipers and air scoop (see Section 23)
2. Detach the clips from the retainers, then remove the side molding as shown.

NOTE: If necessary, replace any damaged clips.



3. Peel off the upper molding.

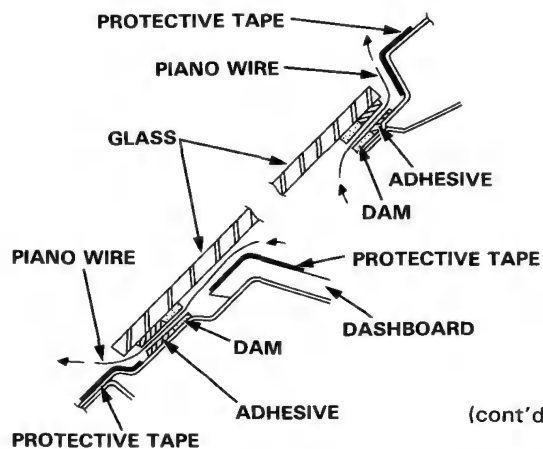
NOTE: When the upper molding removal is difficult, cut the upper rubber portion ① off the molding, then cut the side rubber portion ②.



4. Pull down the front of headliner (page 20-60).

CAUTION: Take care not to bend the headliner excessively.

5. Remove the other retainers from the body.
6. Apply protective tape along the edge of the dashboard and body next to the glass as shown. Using an awl, make a hole through the windshield adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.



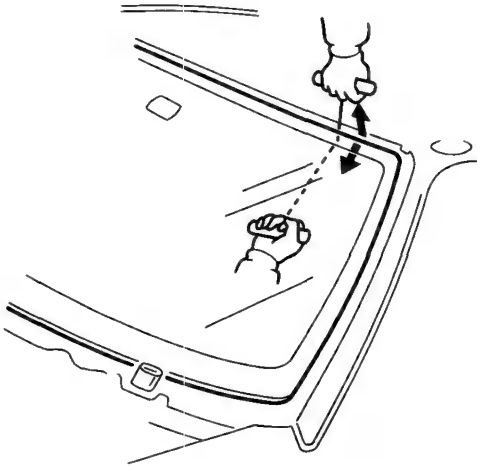
(cont'd)

Windshield

Removal (cont'd)

7. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire windshield.

CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body and dashboard.



8. Cut the rubber spacers away from the body with a knife; they are cemented in place.

NOTE: Replace the rubber spacers with new ones whenever the windshield is removed.

Installation

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire windshield flange.

NOTE:

- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

NOTE: After cleaning, keep oil, grease or water from getting on the surface.

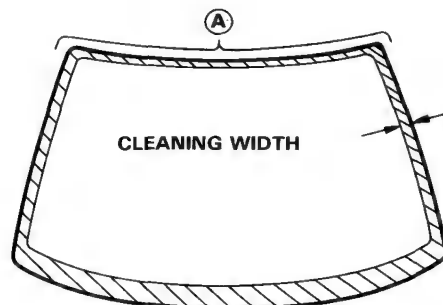
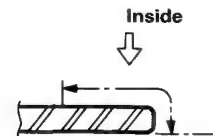
3. If the old glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.

CAUTION: Avoid setting the glass on its edges; small chips may later develop into cracks.

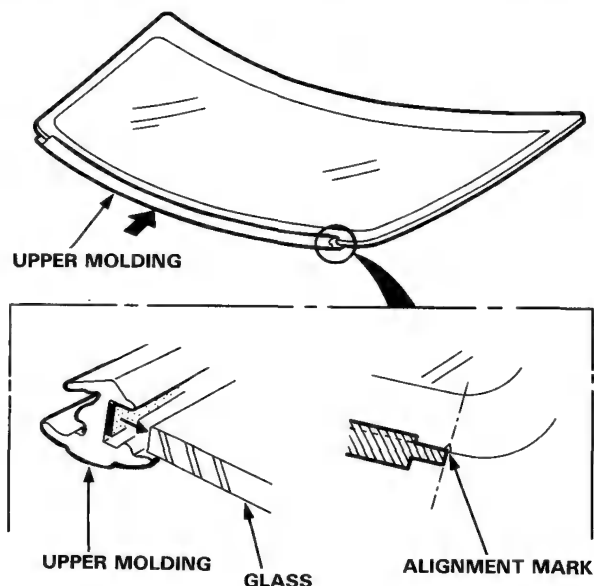
NOTE:

- Clean the shadowed area.
- Clean the area (A) as shown.



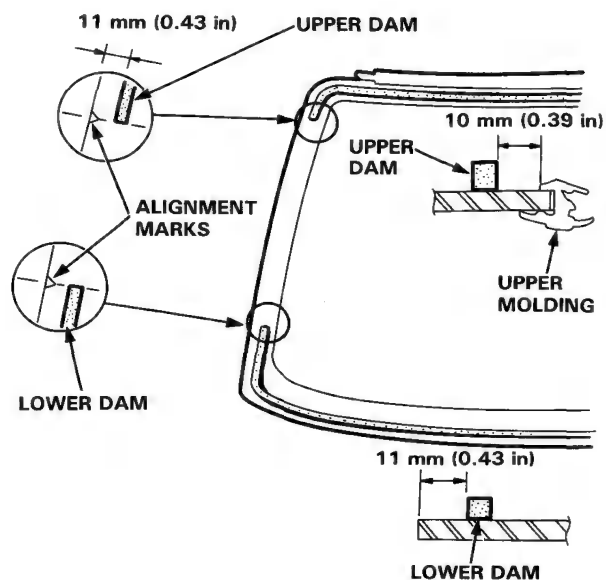


4. Center and glue the upper molding to the upper edge of the windshield.

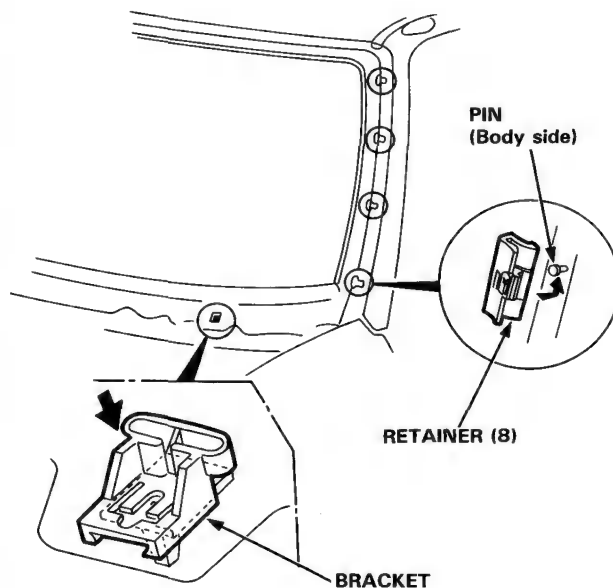


5. Glue the rubber dams to the inside face of the windshield as shown, to contain the adhesive during installation.

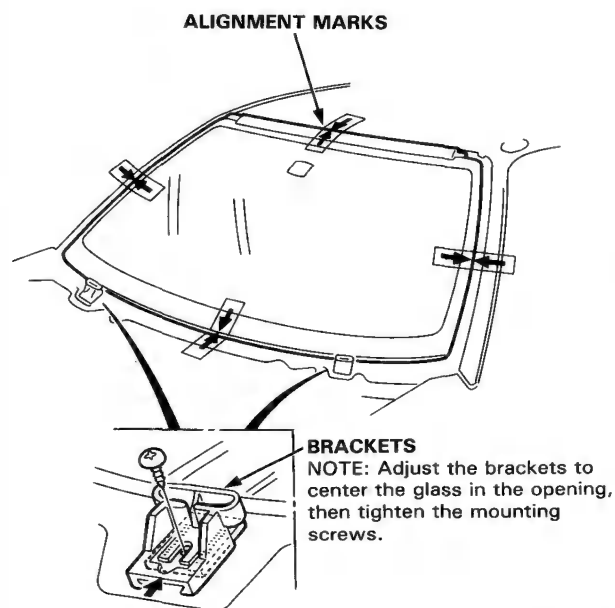
NOTE: Be careful not to touch the glass where adhesive will be applied.



6. Install the glass brackets and clip retainers as shown.



7. Set the windshield upright on the brackets, then center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.



(cont'd)

Windshield

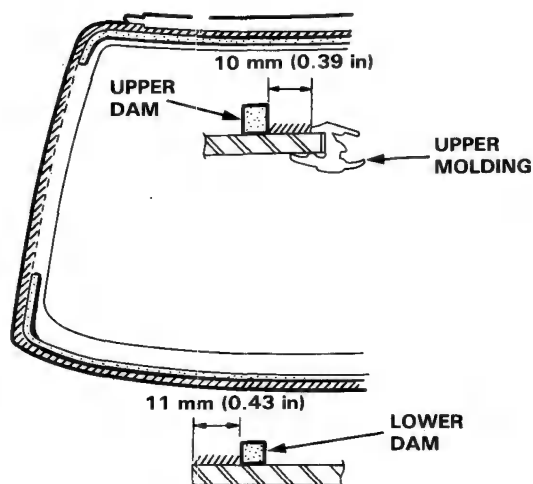
Installation (cont'd)

8. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:

- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the windshield is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

/////// : Apply glass primer here.

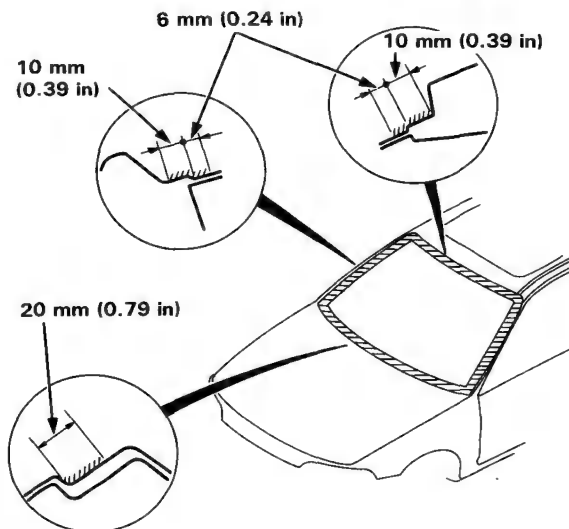


9. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

NOTE:

- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.
- Mask off the dashboard before painting the flange.

//////// : Apply body primer here.



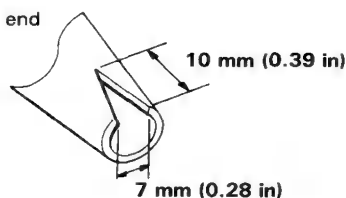
10. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE:

- Clean the plate with a sponge and alcohol before mixing.
- Follow the instructions that come with the adhesive.

11. Before filling a cartridge, cut off the end of the nozzle at the angle shown.

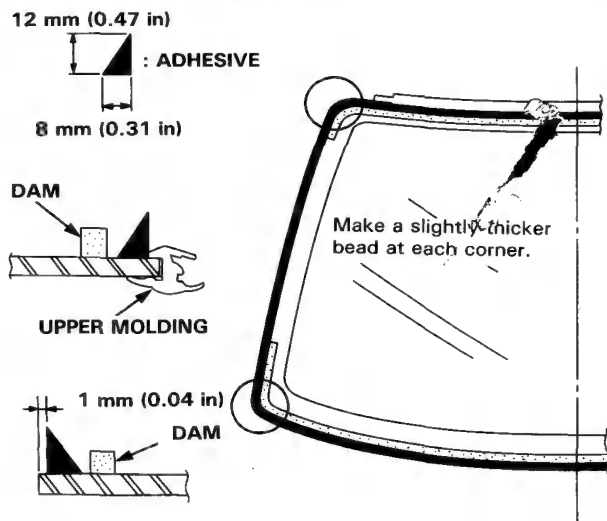
Cut off nozzle end as shown.





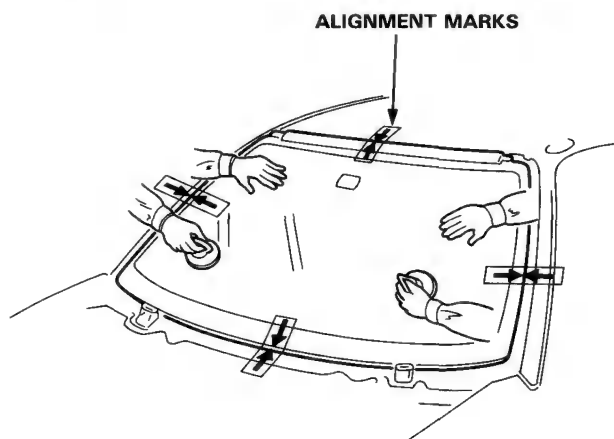
12. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun and run a bead of adhesive around the edge of the glass as shown.

NOTE: Apply the adhesive within 30 minutes after applying the glass primer.

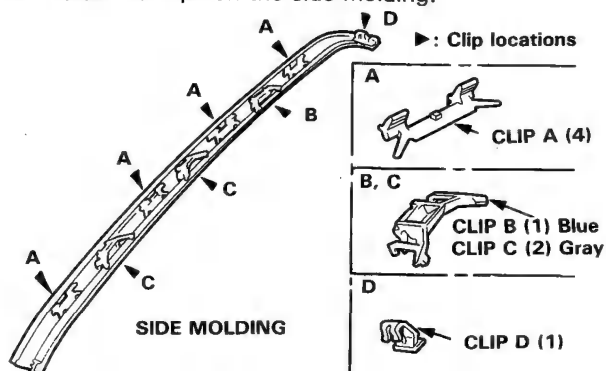


13. Use suction cups to hold the glass over the opening, align it with the marks made in step 7 and set it down on the adhesive. Lightly push on the glass until its edge is fully seated on the adhesive all the way around.

NOTE: Do not close or open the doors until adhesive is dry.



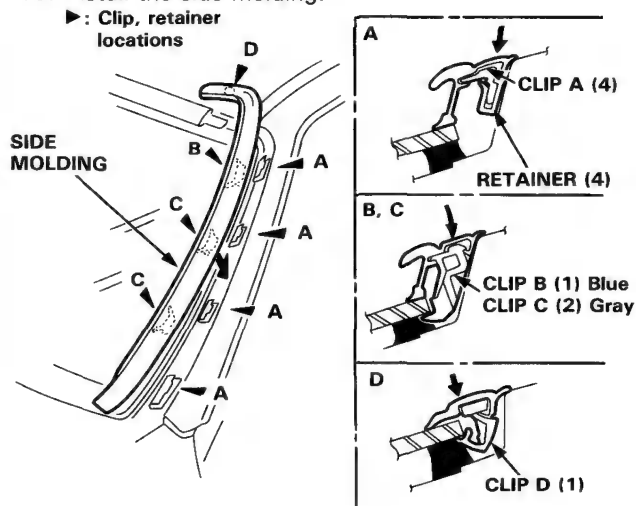
14. Install the clips on the side molding.



15. Scrape or wipe the excess adhesive off with a putty knife or gauze.

NOTE: To remove adhesive from a painted surface or glass, wipe with a soft shop towel dampened with alcohol.

16. Install the side molding.



17. Let the adhesive dry for at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with urethane windshield adhesive.

NOTE:

- Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
- Keep the glass dry for the first hour after installation.
- Check that the ends of the molding are set under the air scoop.

18. Reassemble all removed parts.

Rear Window

Removal

CAUTION:

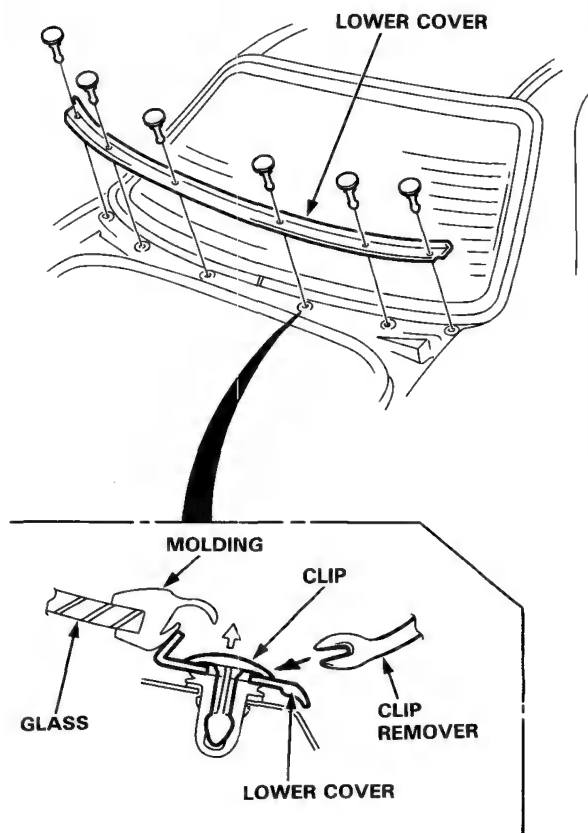
- Wear gloves to remove and install the glass.
- Do not damage the defroster grid lines.

1. To remove the rear glass, first remove:
 - Trunk lid (page 20-88)
 - Rear seat back (pages 20-70, 71, 72)
 - Rear shelf (page 20-63)
 - Rear pillar trim panel (page 20-63)
2. Disconnect the defroster leads, and remove their holders.

NOTE: Avoid scratching or scoring the glass with the cutter blade.

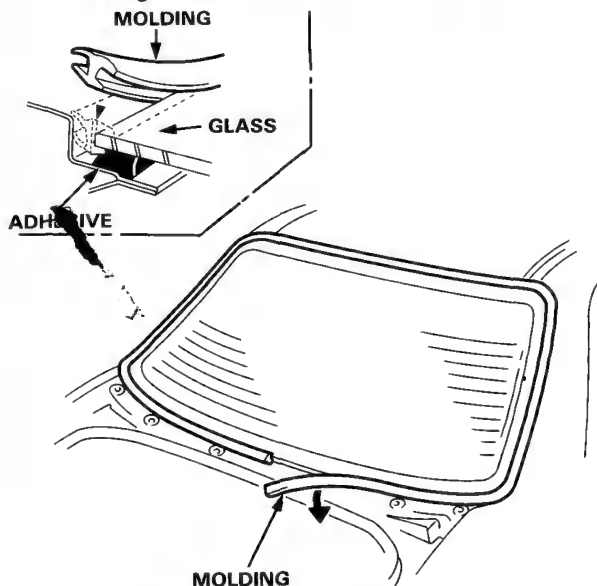
3. Remove the clips, then remove the lower cover.

NOTE: Use a clip remover to remove the clips.



4. Peel off the molding.

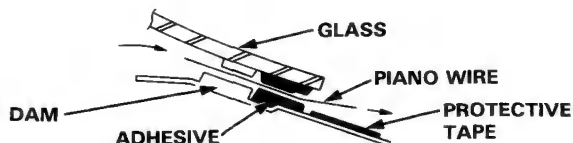
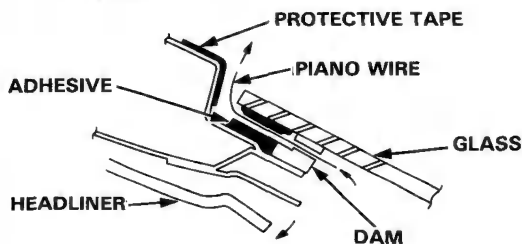
NOTE: When molding removal is difficult, cut the molding with a knife.



5. Pull down the rear of the headliner (page 20-60).

CAUTION: Take care not to bend the headliner excessively.

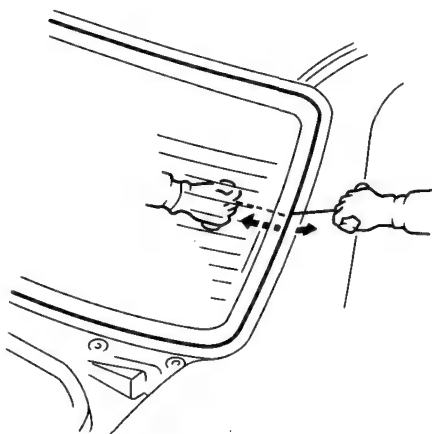
6. Apply protective tape along the edge of the body next to the glass as shown.
Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.





7. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire glass.

CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body.



8. Cut the rubber spacers away from the body with a knife; they are cemented in place.

NOTE: Replace the rubber spacers with new ones whenever the rear window is removed.

Installation

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire glass flange.

NOTE:

- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

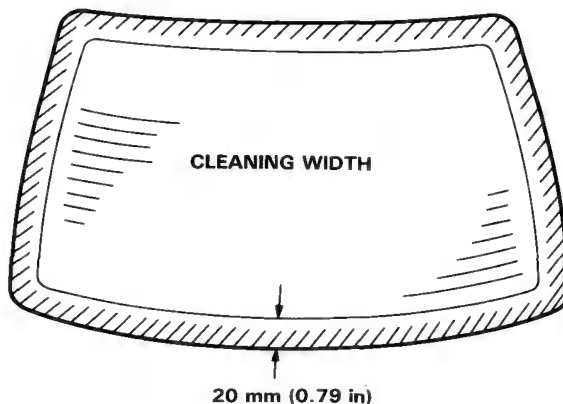
NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the old glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.

CAUTION: Avoid setting the glass on its edges; small chips may later develop into cracks.

NOTE: Clean the shadowed area.

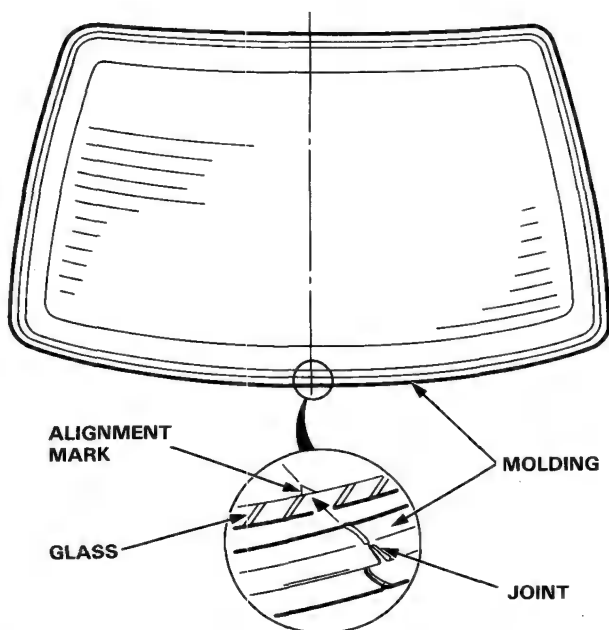


(cont'd)

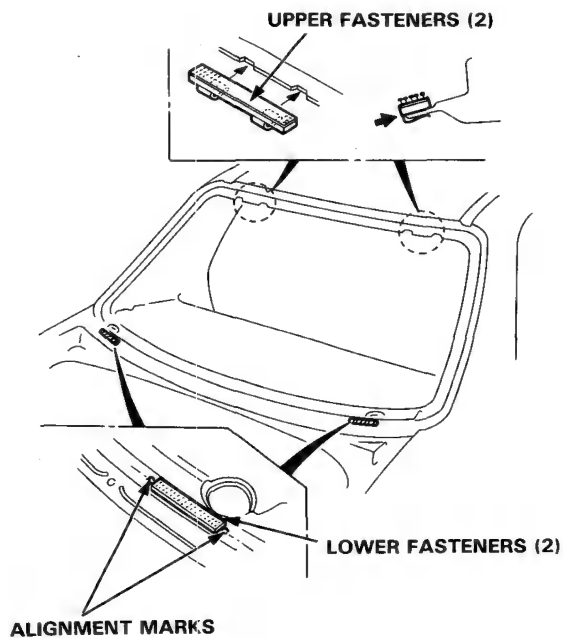
Rear Window

Installation (cont'd)

4. Glue the molding around the edge of the glass as shown.

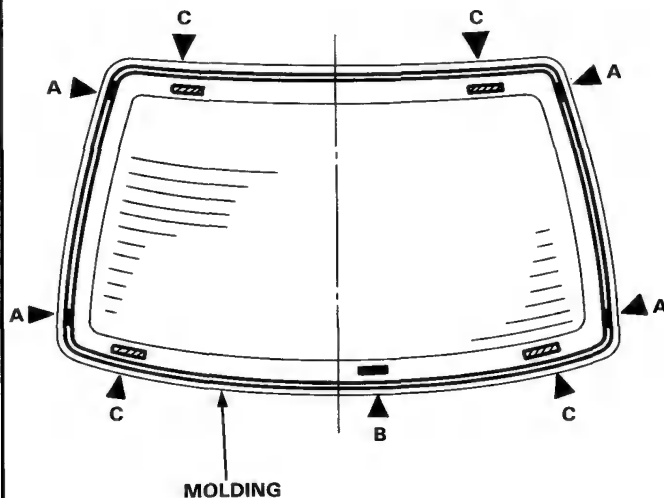
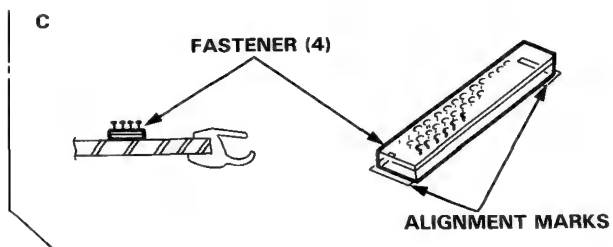
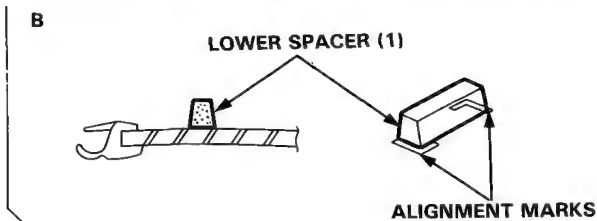
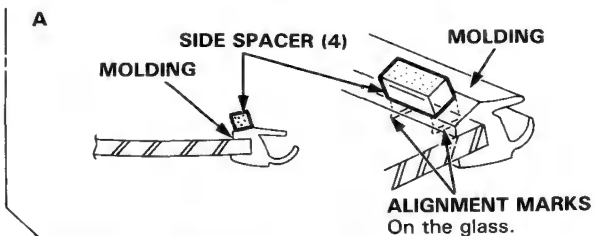


5. Install the upper fasteners and glue the lower fasteners to the body as shown.



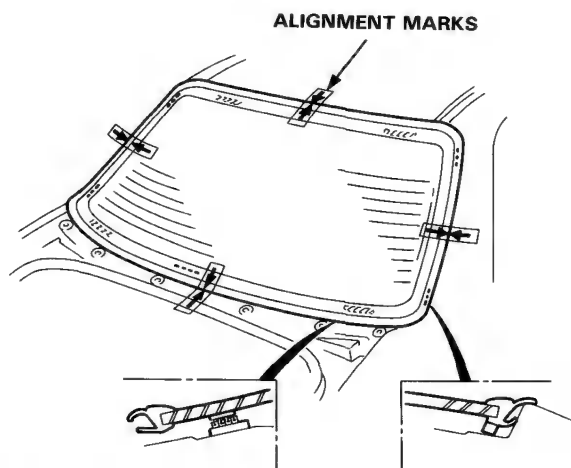
6. Glue the side and lower spacers and fasteners to the inside face of the glass and molding as shown.

►: Spacer, fastener locations





7. Set the glass upright on the glass stoppers, then center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.

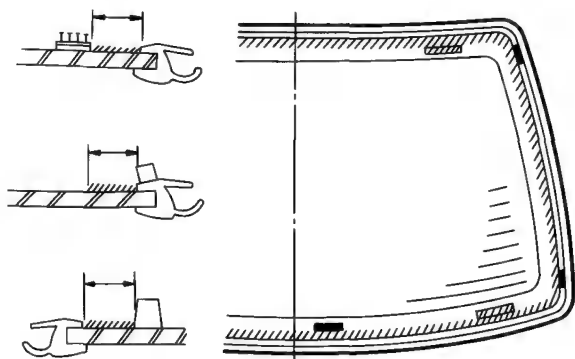


8. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:

- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

//// : Apply glass primer here.

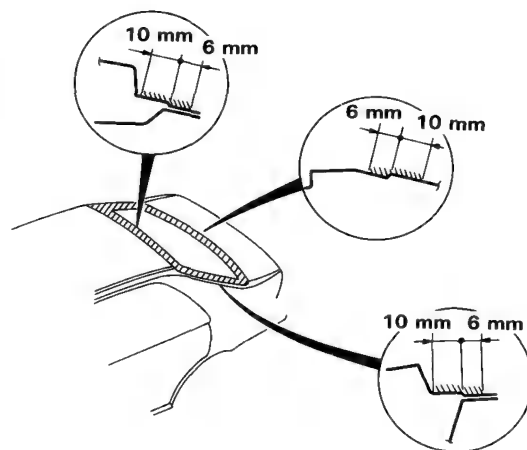


9. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange.

NOTE:

- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.

//// : Apply body primer here.

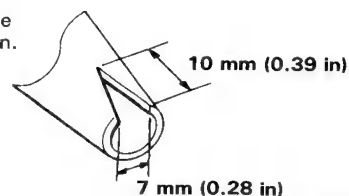


10. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.

NOTE: Clean the plate with a sponge and alcohol before mixing.

11. Before filling a cartridge, cut off the end of the nozzle at the angle shown.

Cut off nozzle end as shown.



(cont'd)

Rear Window

Installation (cont'd)

12. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun and run a bead of adhesive around the edge of the glass as shown.

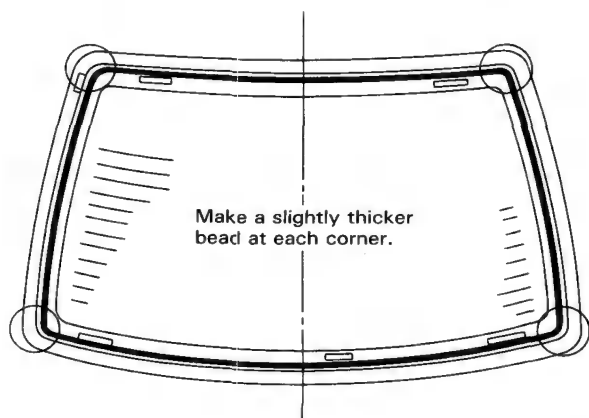
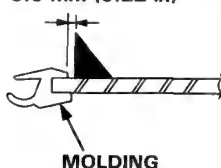
NOTE: Apply the adhesive within 30 minutes after applying the glass primer.

12 mm (0.47 in)



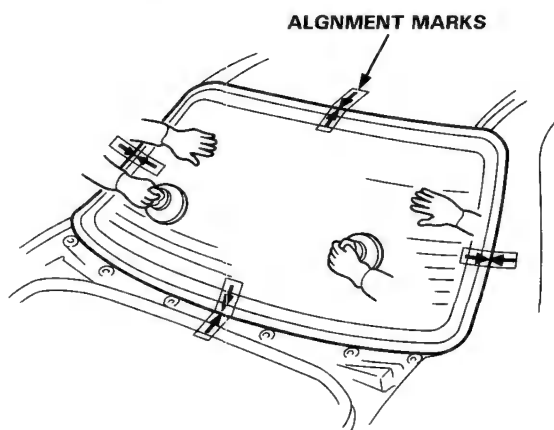
8 mm (0.31 in)

5.5 mm (0.22 in)



13. Use suction cups to hold the glass over the opening, align it with the marks made in step 7 and set it down on the adhesive. Lightly push on the glass until its edges are fully seated on the adhesive all the way around.

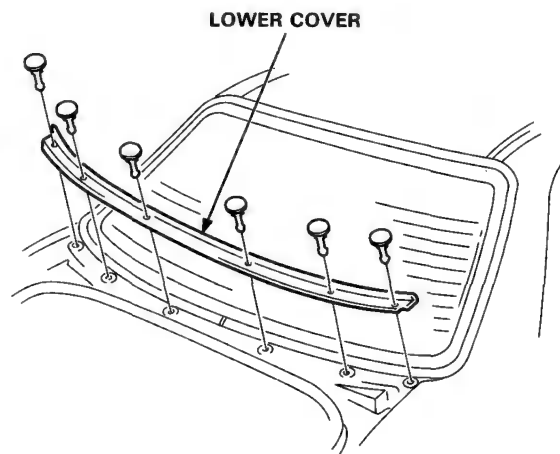
NOTE: Do not close or open the doors until adhesive is dry.



14. Scrape or wipe the excess adhesive off with a putty knife or gauze.

NOTE: To remove adhesive from a painted surface or glass, use a soft shop towel dampened with alcohol.

15. Install the lower cover.



16. After the adhesive is dry, spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant.

NOTE: Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.

17. Raise the headliner back up into position then install:

- Rear pillar trim panel.
- Rear shelf.
- Rear seat back.



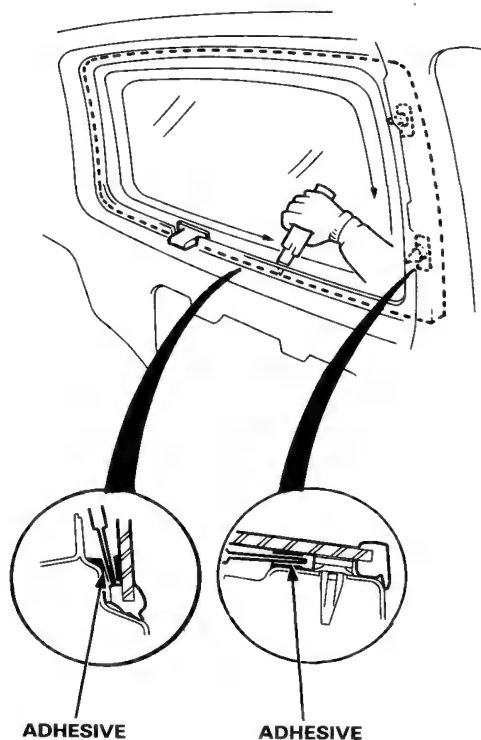
Quarter Glass

Removal

CAUTION:

- Wear gloves to remove and install the glass.
- Use seat covers to avoid damaging any surfaces.

1. To remove the quarter glass, first remove the:
 - Rear seat (pages 20-68, 69)
 - Rear pillar trim panel (pages 20-61, 62)
 - Quarter trim panel (pages 20-61, 62)
2. Use a knife to cut through the glass adhesive from inside the car, all the way around.



Installation

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire window glass flange.

NOTE:

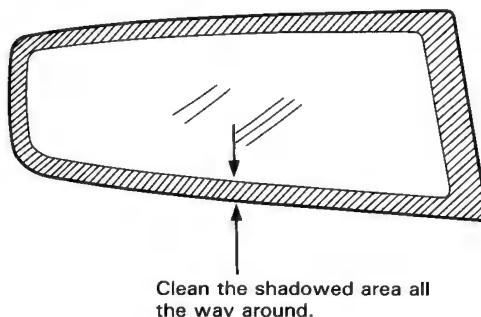
- Do not scrape down to the painted surface of the body: damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the old glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.



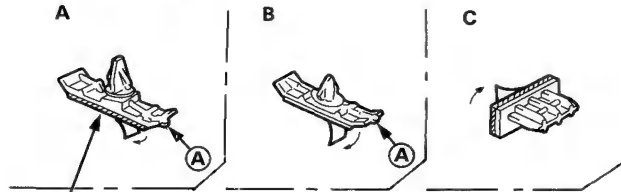
(cont'd)

Quarter Glass

Installation (cont'd)

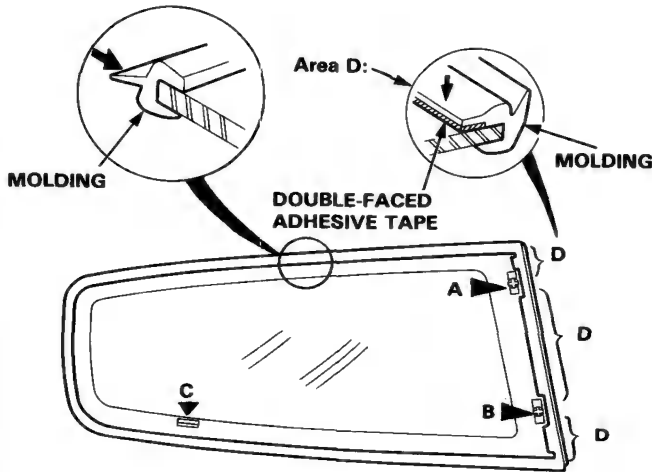
4. Glue the molding around the edge of the glass and install the clips on the inside face of the glass as shown.

►: Clip locations

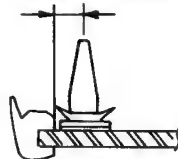
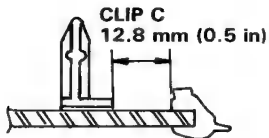


DOUBLE-FACED
ADHESIVE TAPE

NOTE: Turn the location (A)
of the clips to the bottom.



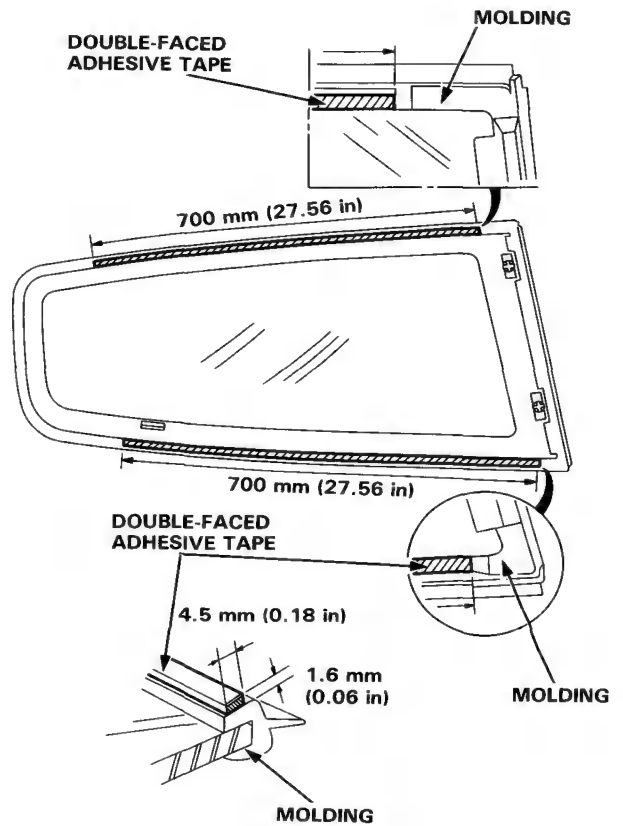
CLIP A: 6 mm (0.23 in)
CLIP B: 6.5 mm (0.25 in)



5. Apply the double-faced adhesive tape to the molding as shown.

NOTE:

- Be careful not to touch the glass where adhesive will be applied.
- Do not peel the separator off the adhesive tapes.



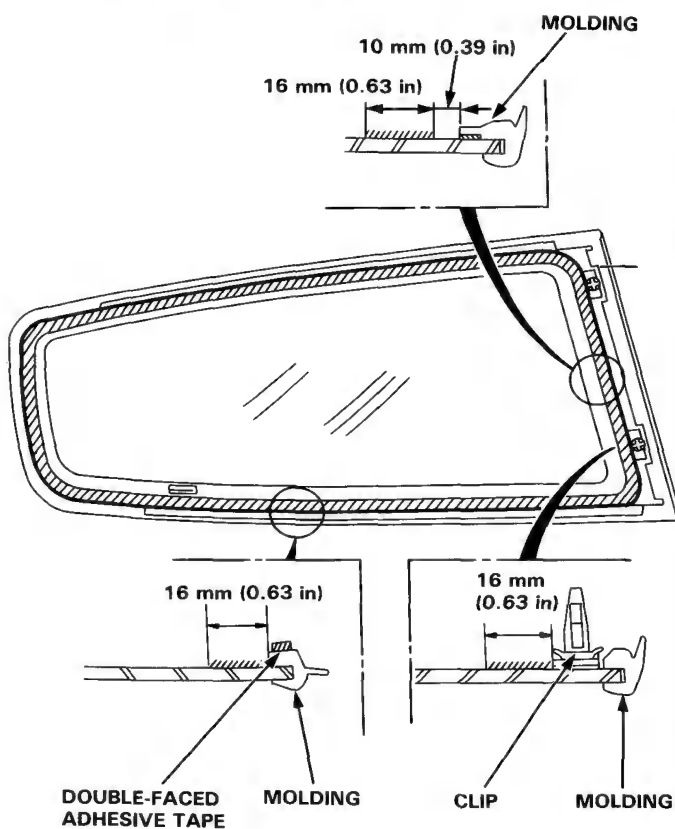


6. With a sponge, apply a light coat of glass primer to the inside face of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:

- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

/// : Apply glass primer here.

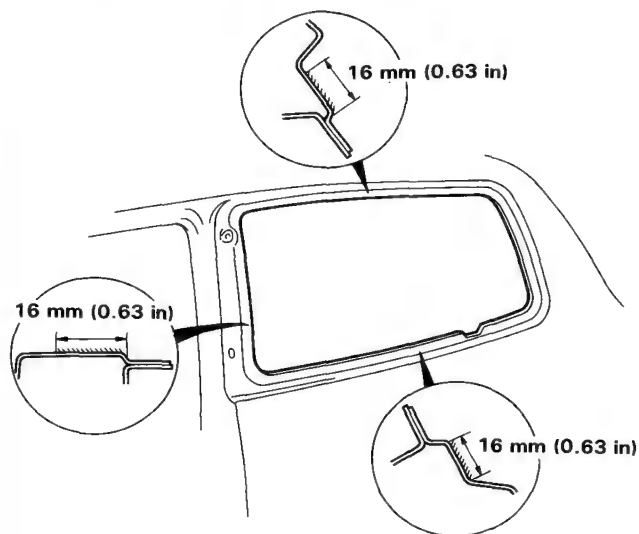


7. With a sponge, apply a light coat of body primer to the original adhesive remaining around the quarter window opening flange.

NOTE:

- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.

/// : Apply body primer here.



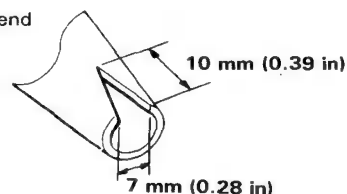
8. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE:

- Clean the plate with a sponge and alcohol before mixing.
- Follow the instructions that came with the adhesive.

9. Before filling a cartridge, cut off the end of the nozzle at the angle shown.

Cut off nozzle end as shown.



(cont'd)

Quarter Glass

Installation (cont'd)

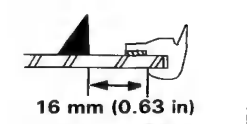
10. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun and run a bead of adhesive around the edge of the glass as shown.

NOTE: After applying the adhesive, peel the separator off the adhesive tapes.

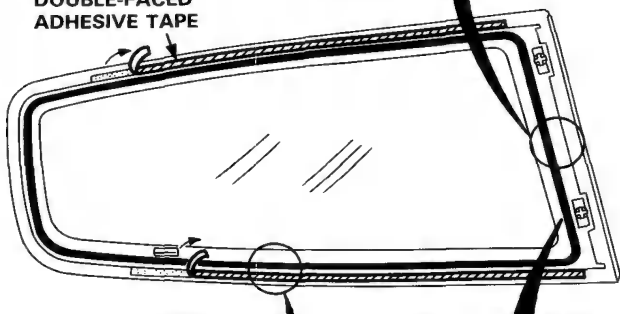
12 mm (0.47 in)

ADHESIVE

8 mm (0.31 in)

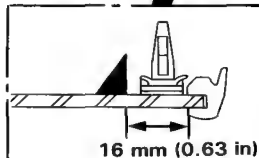


DOUBLE-FACED
ADHESIVE TAPE



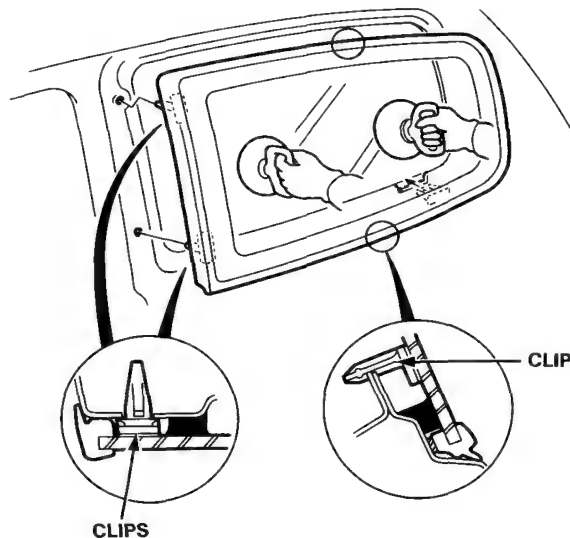
1.3 mm (0.05 in)

DOUBLE-FACED
ADHESIVE TAPE



11. Use suction cups to hold the glass over the opening, align it with the clip setting points and set it down on the adhesive. Lightly push on the glass until its edges are fully seated on the adhesive all the way around.

NOTE: Do not open or close the doors until the adhesive is dry.



12. Scrape or wipe the excess adhesive off with a putty knife or gauze.

NOTE: Use a soft shop towel dampened with alcohol to remove adhesive from a painted surface or glass.

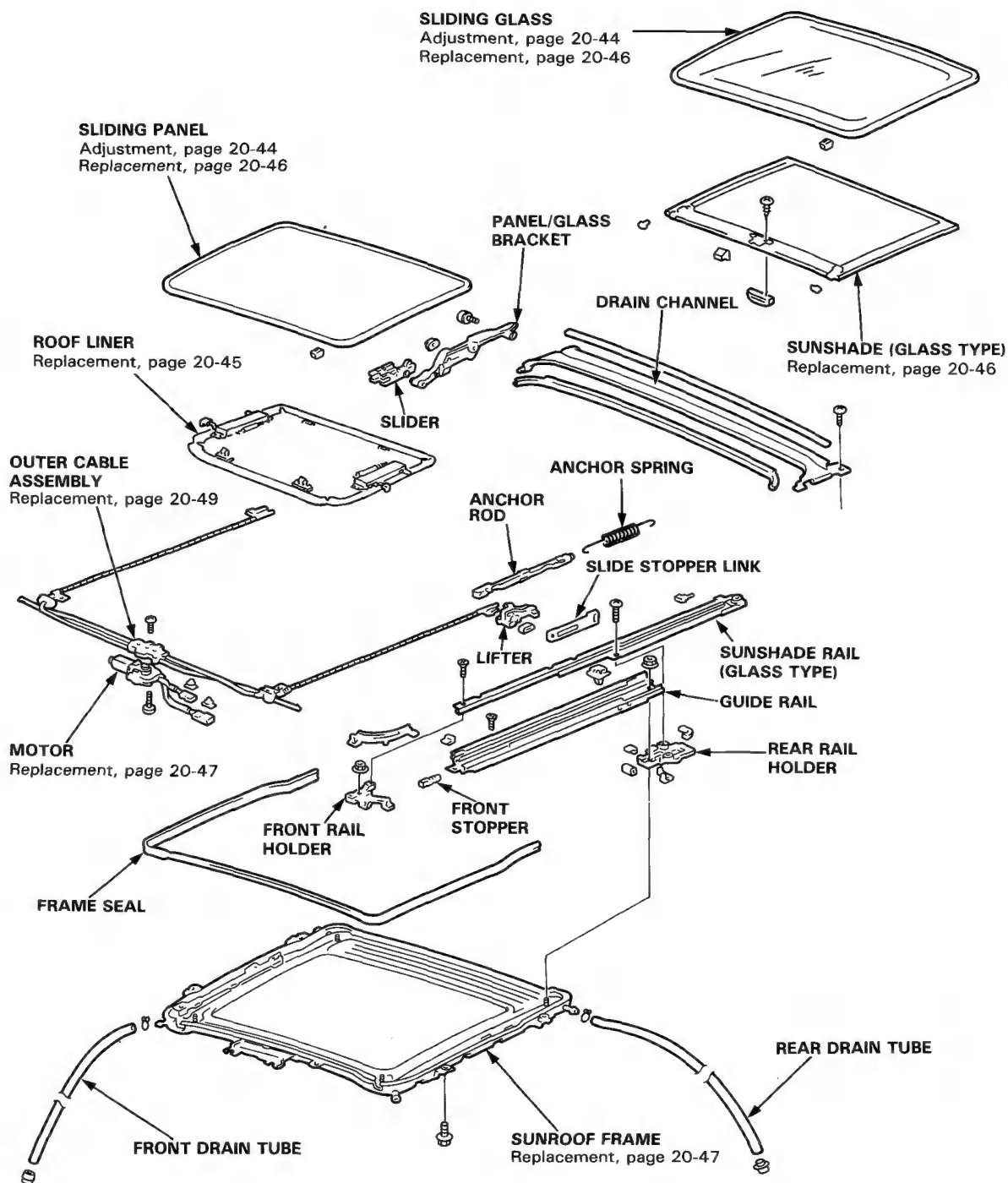
13. After the adhesive is dry, spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant.

NOTE: Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.

14. Reinstall all remaining removed parts.



Outer Slide Model (3D):



Sunroof

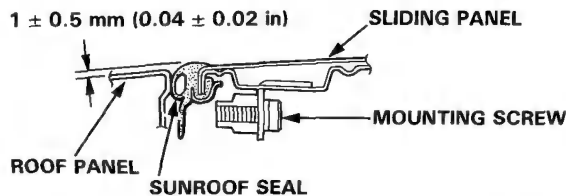
Troubleshooting

Symptom	Probable Cause
Water leak	<ol style="list-style-type: none"> 1. Clogged drain tube. 2. Gap between sunroof seal and roof panel. 3. Defective or improperly installed sunroof seal. 4. Gap between drain seal and roof panel.
Air leak, wind noise	<ol style="list-style-type: none"> 1. Excessive clearance between sunroof seal and roof panel.
Motor noise	<ol style="list-style-type: none"> 1. Loose motor. 2. Worn gear or bearing. 3. Outer cable deformed.
Sliding panel or sliding glass does not move, but motor turns	<ol style="list-style-type: none"> 1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Outer cable not attached properly.
Sliding panel or sliding glass does not move and motor does not turn (Sliding panel or sliding glass can be moved with sunroof wrench)	<ol style="list-style-type: none"> 1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor. 5. Faulty relay.

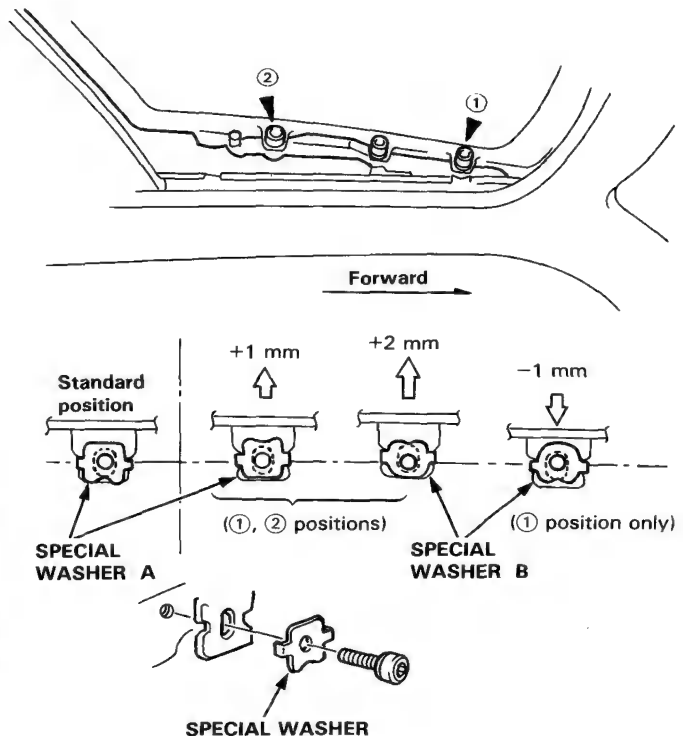
Panel/Glass Height Adjustment

Roof panel should be even with the sunroof seal, to within 1 ± 0.5 mm (0.04 ± 0.02 in) all the way around. If not, slide sunshade back (Glass Type), and:

1. Tilt-up the sliding panel or sliding glass.
2. Remove the roof liner (Panel Type).
3. Loosen the mounting screws and adjust the sliding panel or sliding glass by turning the special washers A and B.
4. Repeat on opposite side if necessary.



5. Side-to-side fit of sunroof seal can be adjusted by loosening the sunroof frame mounting bolts and moving the frame right or left and forward or backward by hand (page 20-47).

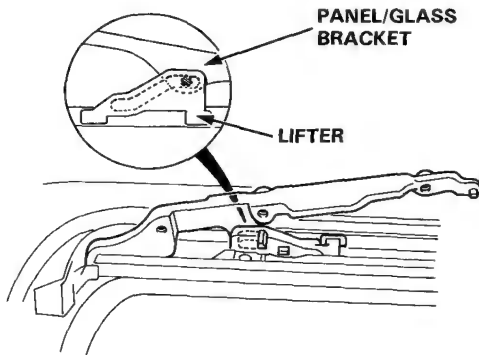




Rear Edge Closing Adjustment

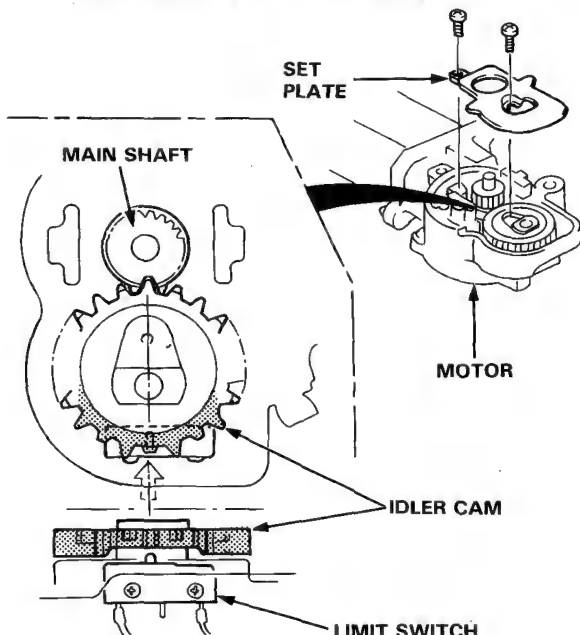
Open the panel or glass about a foot, then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against the roof panel, or too late and does not seat tightly enough, adjust it.

1. Remove the sliding panel or sliding glass.
2. Remove the sunroof motor (page 20-47).
3. Align the tilt-up position of the lifter on each side.



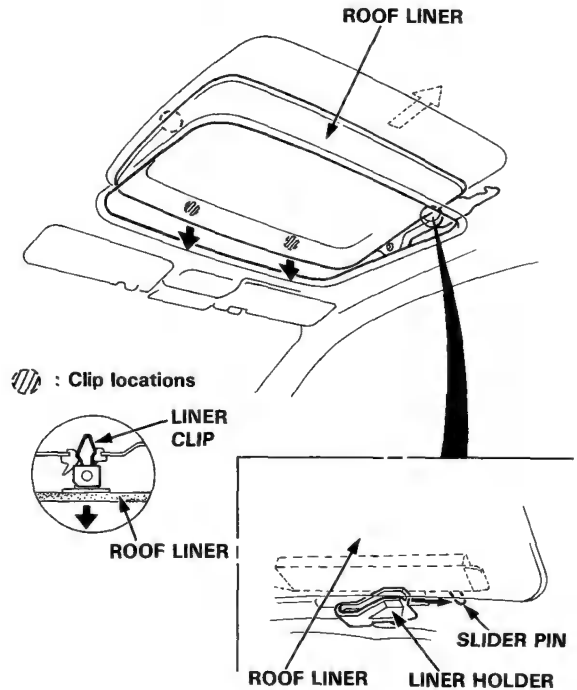
4. Check that the alignment left and right, then install the sunroof motor.

NOTE: If necessary, check the tilt-up position of sunroof motor (idler cam) as shown.



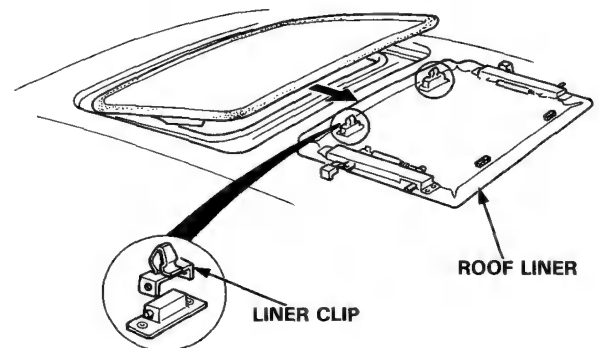
Roof Liner Replacement (Panel Type)

1. Open the sliding panel halfway.
2. Carefully detach the 2 liner clips.
3. Remove the slider pin in the roof liner from the liner lifter by sliding it backward.



4. Slide the roof liner backward, then remove it.

NOTE: If necessary, replace the liner clips.



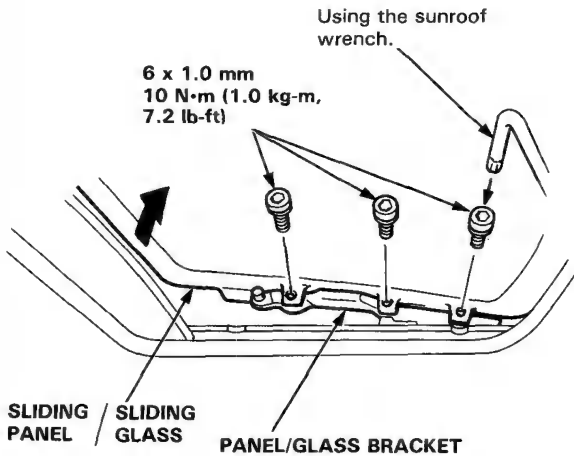
5. Installation is the reverse of the removal procedure.

NOTE: When installing, make sure the slider pins and liner clips are set.

Sunroof

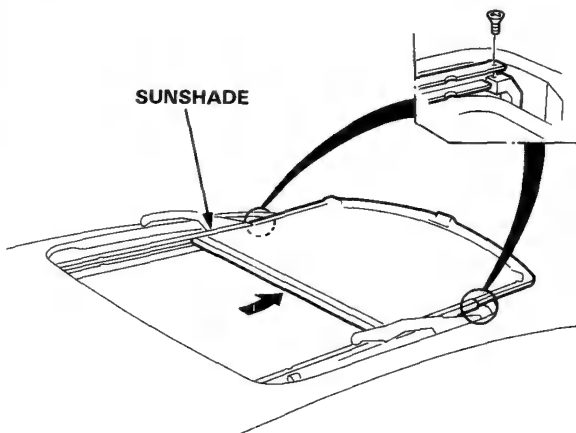
Panel/Glass and Sunshade Replacement

1. Open the sunshade (Glass Type).
2. Tilt-up the sliding panel or sliding glass.
3. Remove the roof liner (Panel Type) (page 20-45).
4. Remove the mounting screws, then remove the sliding panel or sliding glass from the bracket.



Glass Type:

5. Remove the screws and lift the sunshade rails.
6. Slide the sunshade forward, then remove the sunshade.



7. Installation is the reverse of the removal procedure.
8. Check for water and air leaks.

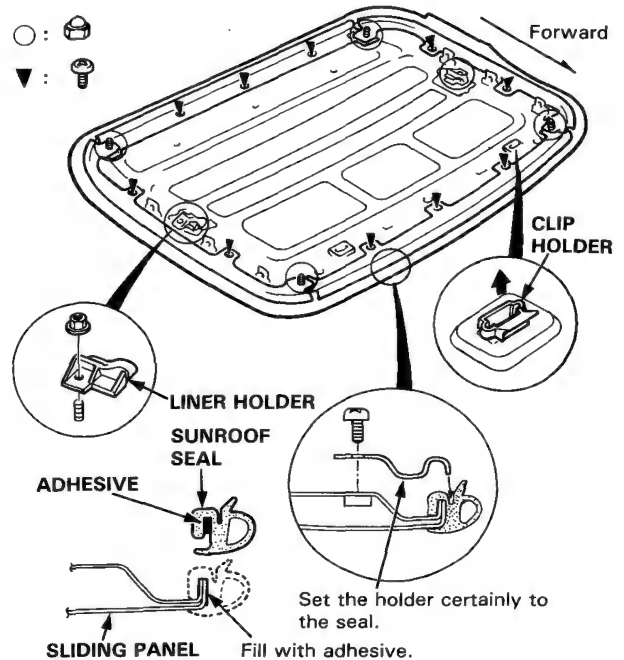
NOTE: Do not use high pressure water.

Seal Repair/Installation (Panel Type)

If a seal is leaking, or if it is to be replaced proceed as follows.

1. Remove the roof liner (page 20-45).
2. Remove the sliding panel.
3. Remove the seal holder. Carefully peel the seal off the sliding panel.

NOTE: If necessary, replace the clip holders.



4. Clean the seal attaching surfaces with a clean cloth dampened in alcohol.

NOTE: After cleaning, keep oil, grease or water from getting on the surface.

5. Fill the seal groove with adhesive. Coat the seal attaching surfaces of the sliding panel with the same adhesive.
6. Fit the seal onto the sliding panel evenly all the way around.
7. Wipe off excess adhesive with a clean cloth dampened with alcohol.
8. Allow the adhesive to cure for at least 4 hours after seal installation and before operating the sunroof.
9. Check for water and air leaks.

NOTE: Do not use high pressure water.



Motor, Drain Tube and Frame Replacement

CAUTION: Be careful not to damage the seats, dashboard and other interior trim.

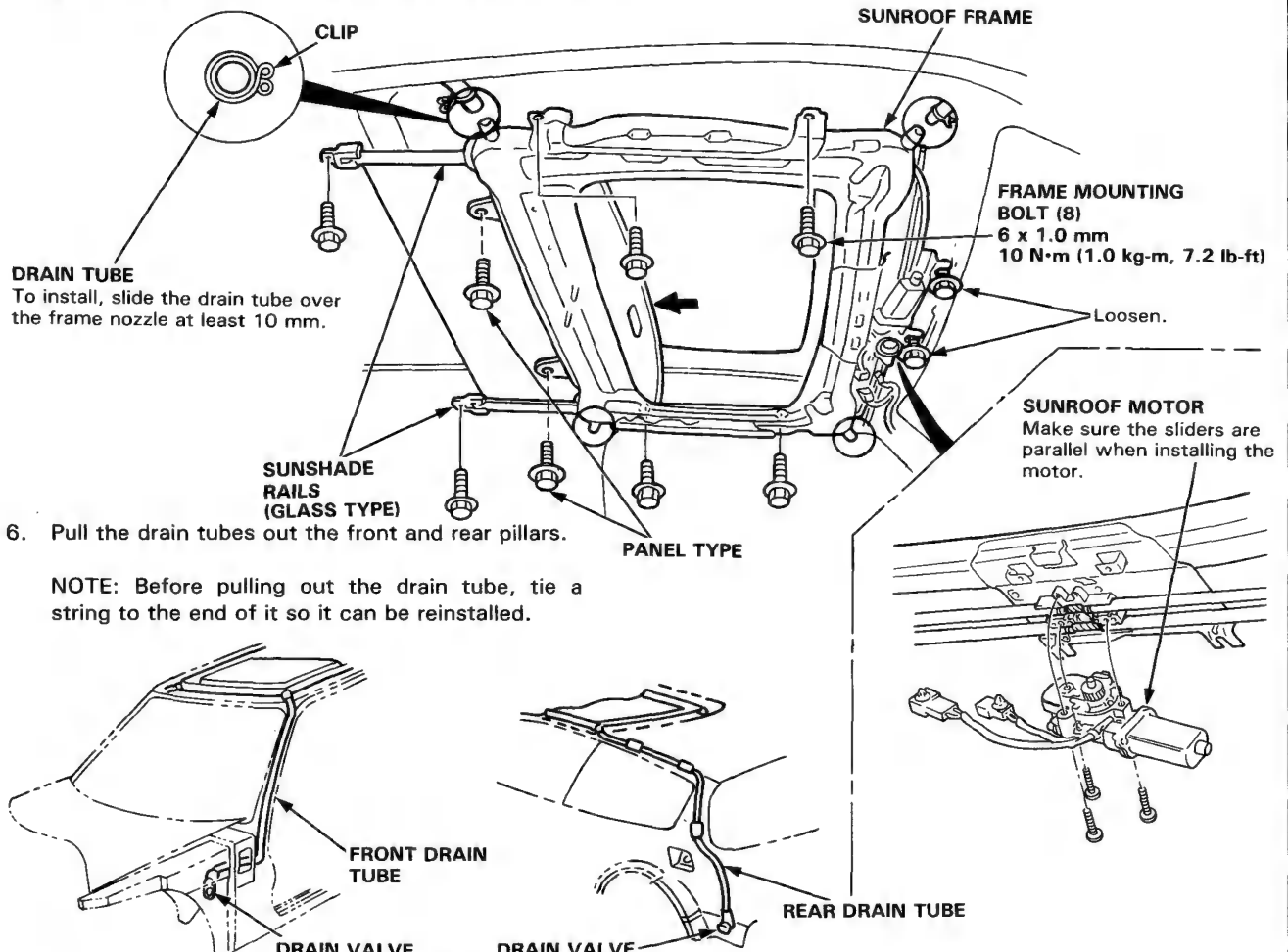
1. Remove the panel or glass and headliner (page 20-60).
2. Disconnect the motor and limit switch wire harness; remove the clips securing the ceiling light wire harness.

NOTE: When removing the sunroof motor, remove the 3 screws.

3. Disconnect the drain tubes.
4. Loosen the front mounting bolts.
5. Remove the 6 mounting bolts, then remove the frame from the car.

NOTE:

- You may require assistance when removing the frame.
- Take care not to bend the sunshade rails (Glass Type).



6. Pull the drain tubes out the front and rear pillars.

NOTE: Before pulling out the drain tube, tie a string to the end of it so it can be reinstalled.

7. Install parts in the reverse order of the removal procedure.

NOTE:

- Install the tube clips with the ends facing the side to ease installation of the headliner.
- Clean the surface of sunroof frame.
- Check the drain seal assembly.
- Check for water and air leaks.
- Check for smooth movement of the sunshade (Glass Type).

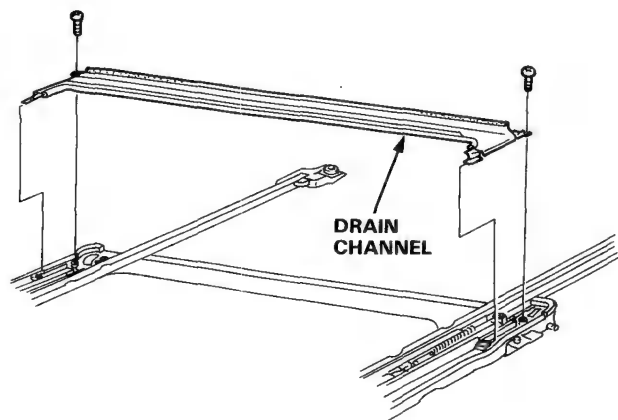
Sunroof

Panel or Glass Bracket/Slider, Lifter and Guide Rails Replacement

1. Remove the sunroof frame (page 20-47).

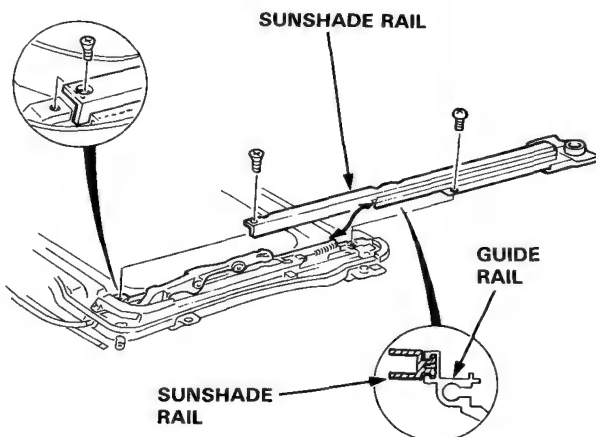
2. Remove the drain channel.

NOTE: Take care not to damage, twist or lift the seal.



Glass Type:

3. Remove the screws and sunshade rail by sliding it backward.

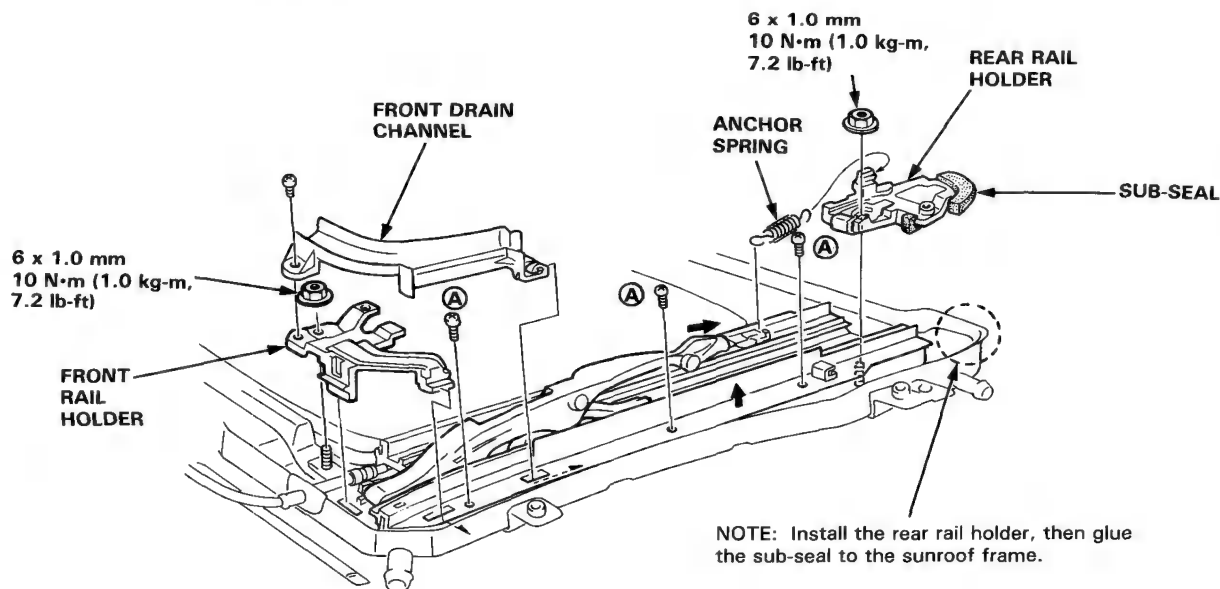


4. Remove the sunroof motor.

5. Remove the front drain channel.

6. Remove the nut, then remove the front and rear rail holder.

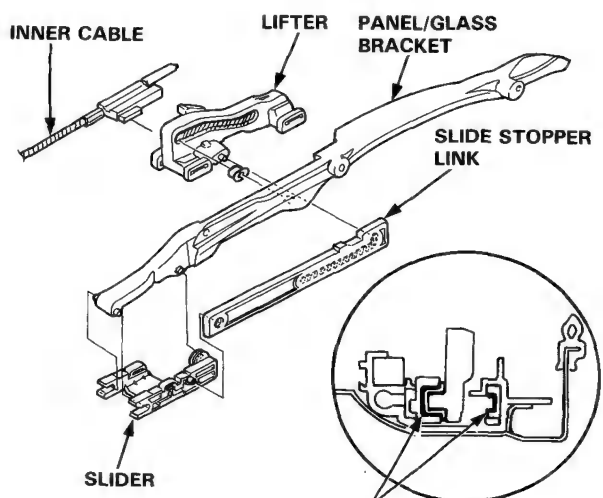
7. Remove the guide rail mounting screws (A), then lift the guide rail.



8. Slide the panel or glass bracket/lifter backward, then remove it.

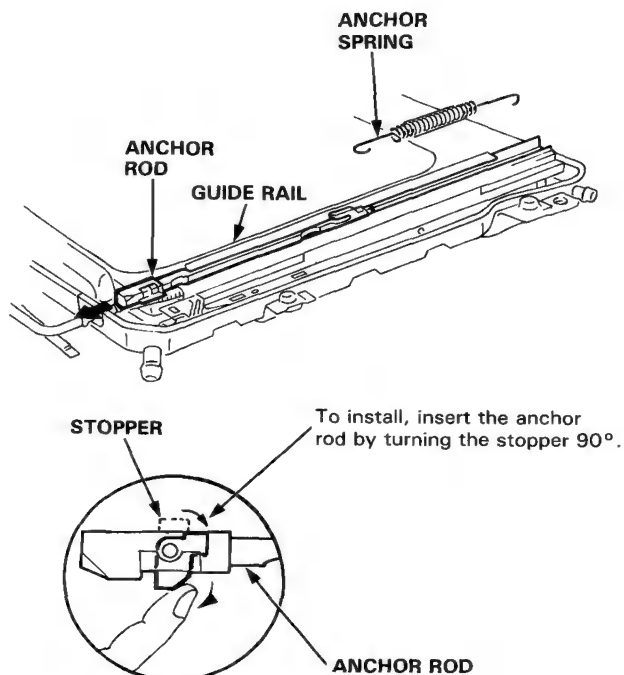


9. Separate the panel or glass bracket, lifter, slide stopper link and slider.



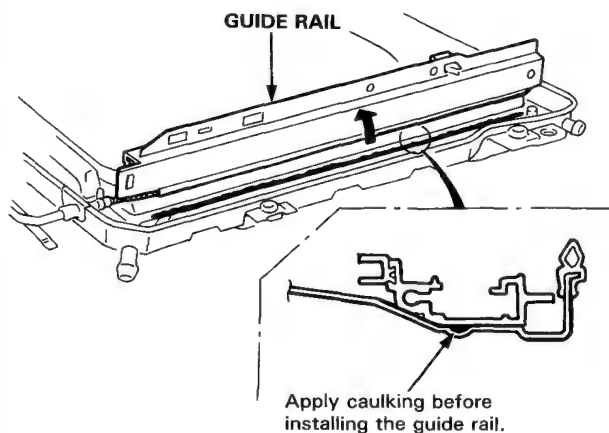
NOTE: To install, apply multipurpose grease to the lifter and slide stopper link.

10. Slide the anchor rod forward, then remove it from the guide rail.



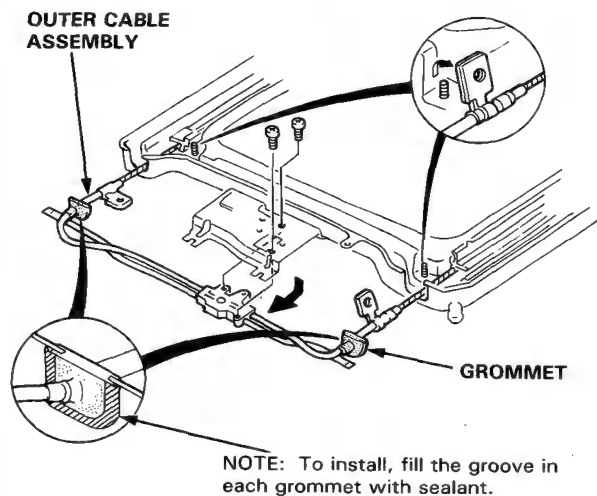
11. Slide the guide rail backward, then remove the guide rail from the inner cable.

NOTE: To install, apply the caulking to guide rail mount faces of the sunroof frame.



12. Remove the screws, then remove the outer cable assembly from the sunroof frame.

NOTE: Take care not to bend the cable pipes.



13. Installation is the reverse of the removal procedure.

NOTE:

- Damaged parts should be replaced.
- Apply grease to the sliding portion.

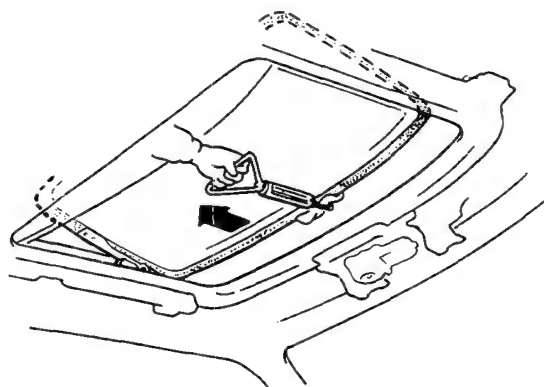
Sunroof

Closing Drag Check (Motor Removed)

Before installing the sunroof motor, measure effort required to open the sliding panel or sliding glass using a spring scale as shown.

CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop towel.

If load is over 98 N (10 kg, 22 lb), check side clearance and panel or glass height adjustment (page 20-44).

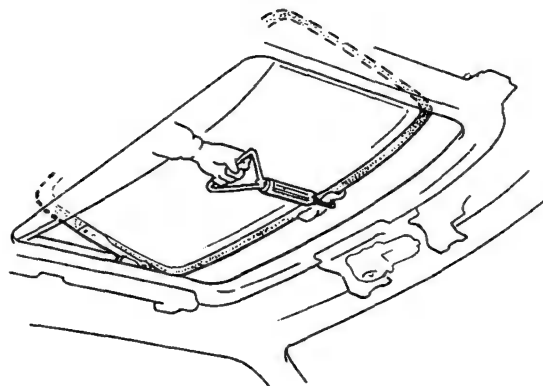


Closing Force Check (Motor Installed)

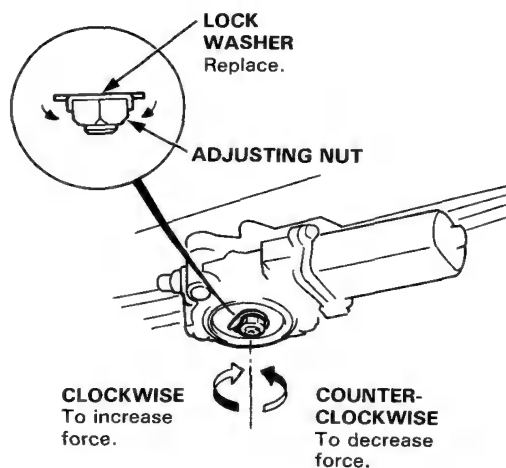
1. After installing all removed parts, have a helper hold the switch to close the sliding panel or sliding glass while you measure force required to stop it. Attach a spring scale as shown. Read the force as soon as the panel or glass stops moving, then immediately release the switch and spring scale.

CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop towel.

Closing Force: 196–245 N
(20–30 kg, 44–55 lb)



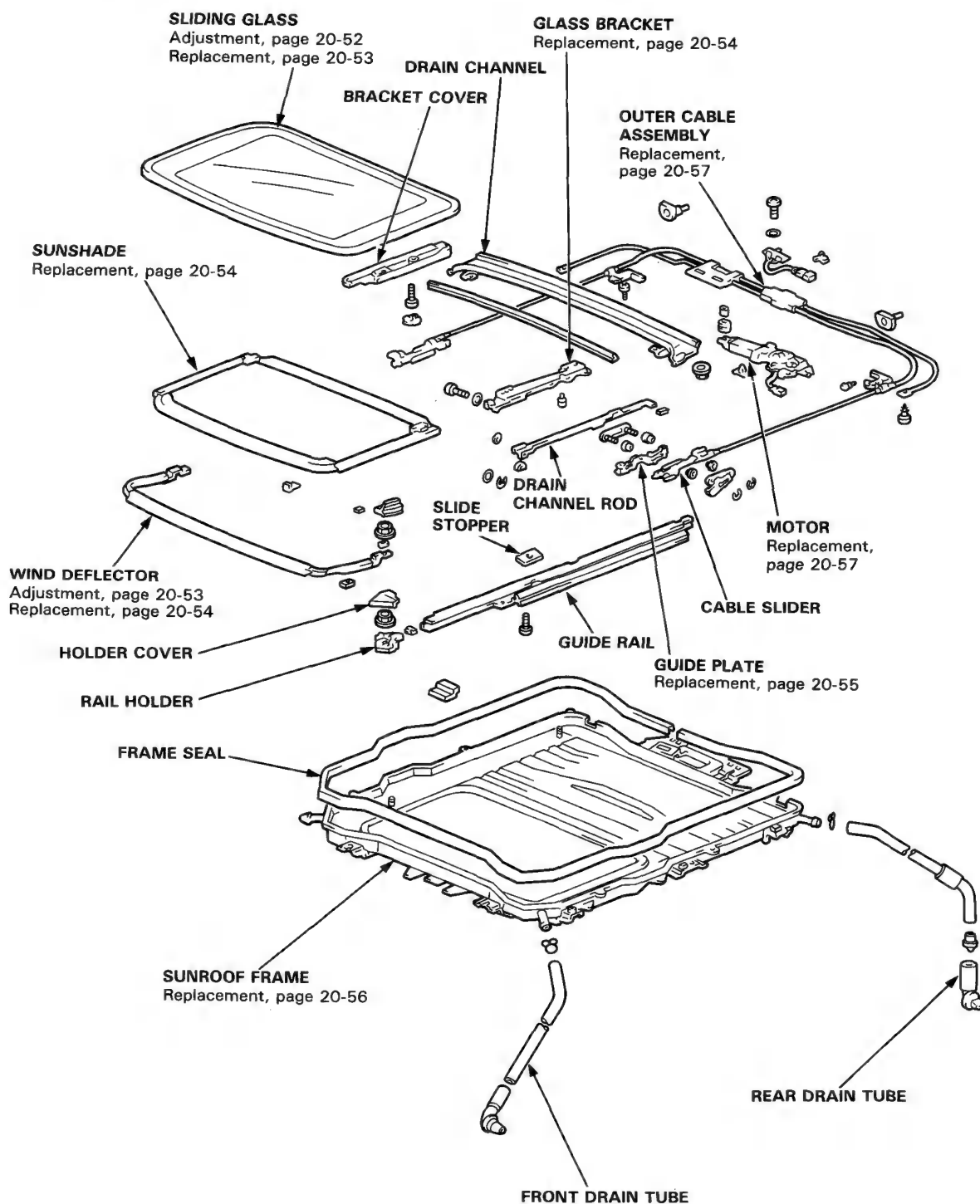
2. If force is not within specification, install a new lock washer, adjust the tension by turning the sunroof motor clutch adjusting nut, and bend the lock washer against the adjusting nut.





Index

Inner Slide Model (4D):



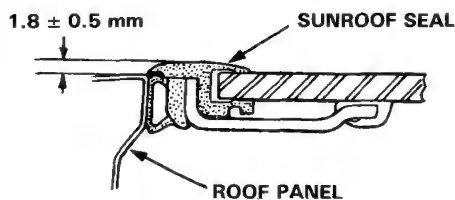
Sunroof

Troubleshooting

Symptom	Probable Cause
Water leak	<ol style="list-style-type: none"> 1. Clogged drain tube. 2. Gap between sunroof seal and roof panel. 3. Defective or improperly installed sunroof seal. 4. Gap between frame seal and roof panel.
Air leak, wind noise	<ol style="list-style-type: none"> 1. Excessive clearance between sunroof seal and roof panel.
Deflector noise	<ol style="list-style-type: none"> 1. Improper clearance between deflector seal and roof panel. 2. Insufficient deflector extension. 3. Deformed deflector.
Motor noise	<ol style="list-style-type: none"> 1. Loose motor. 2. Worn gear or bearing. 3. Outer cable deformed.
Sliding glass does not move, but motor turns	<ol style="list-style-type: none"> 1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Outer cable not attached properly.
Sliding glass does not move and motor does not turn (Sliding glass can be moved with sunroof wrench)	<ol style="list-style-type: none"> 1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor.

Glass Height Adjustment

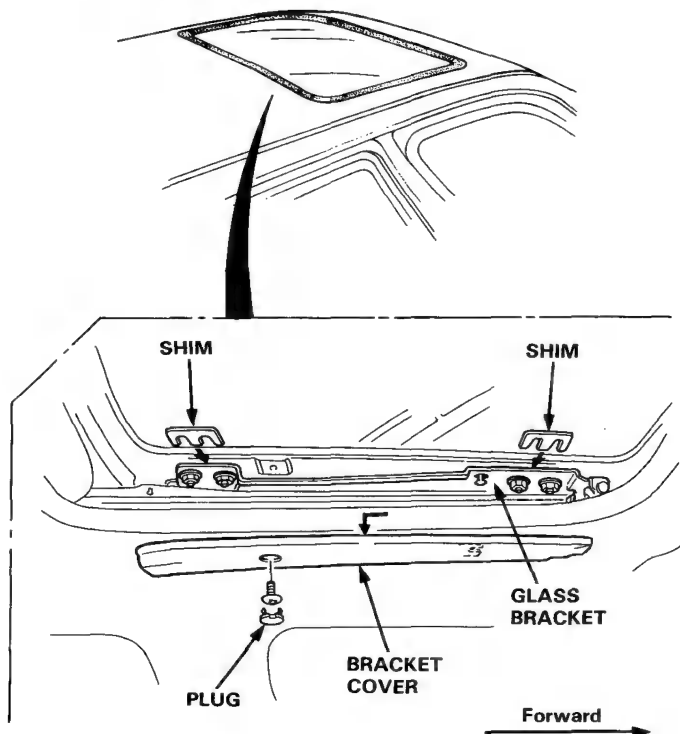
Roof panel should be even with the sunroof seal, to within 1.8 ± 0.5 mm (0.07 ± 0.02 in) all the way around. If not, open the glass fully, and:



1. Pry the plug out of the bracket cover, remove the screw, then slide the cover off to the rear.
2. Loosen the bracket mounting nuts and install shims between glass frame and bracket as shown.

Shim thickness: Front max. 3 mm (0.12 in)
Rear max. 2 mm (0.08 in)

3. Repeat on opposite side if necessary.



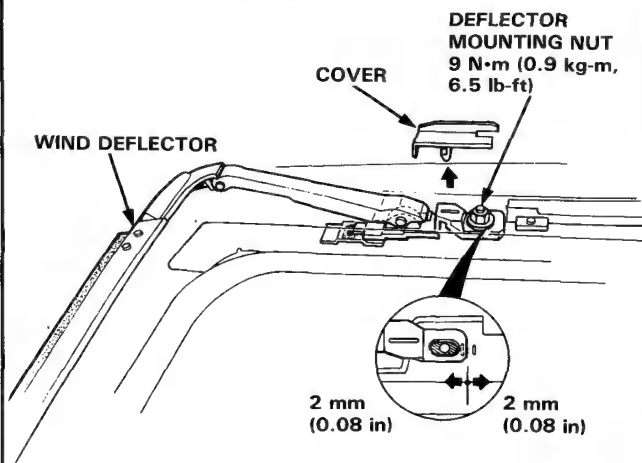


Wind Deflector Adjustment

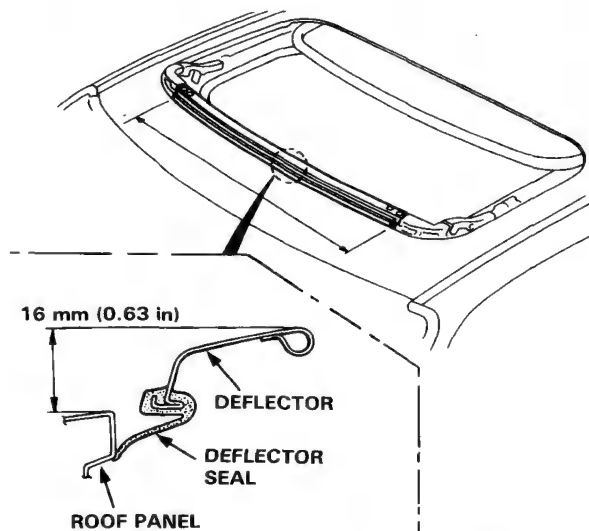
NOTE: A gap between deflector seal and roof panel will cause wind noise when driving at high speed with the sunroof open.

1. Open the sunroof and pry the rail covers off both sides.
2. Loosen the deflector mounting nuts.

NOTE: The wind deflector can be adjusted 2 mm (0.08 in) forward or backward.



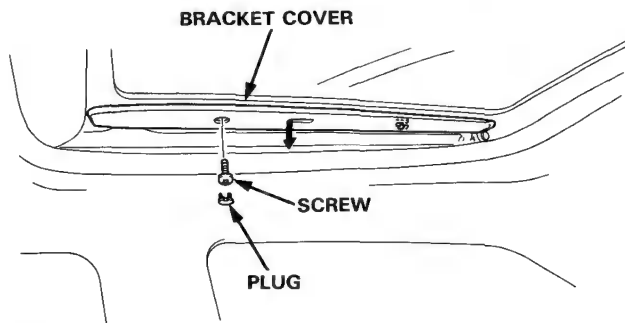
3. Adjust the deflector forward or backward so the edge of its seal touches the roof panel evenly. The deflector seal should touch the roof panel across entire front edge.



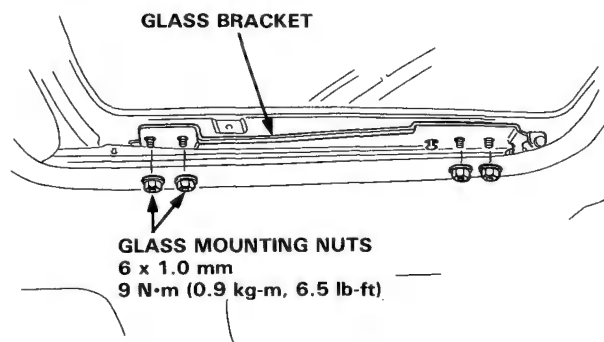
NOTE: The height of the deflector arm when open cannot be adjusted. If damaged or deformed, replace it (page 20-54).

Sliding Glass Replacement

1. Close the glass fully.
2. Slide sunshade all the way back.
3. Pry the plug out of each bracket cover, remove the screw, and slide the cover off to the rear.

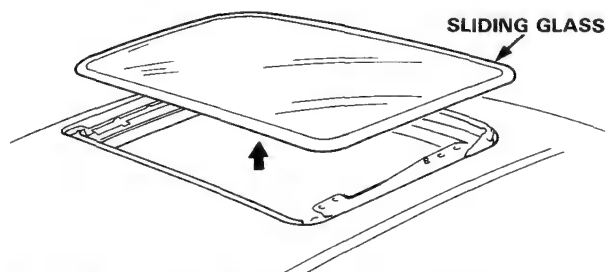


4. Remove the mounting nuts from the glass brackets on both sides.



5. Remove the glass by lifting up and pulling forward as shown.

NOTE: Do not damage the roof panel.



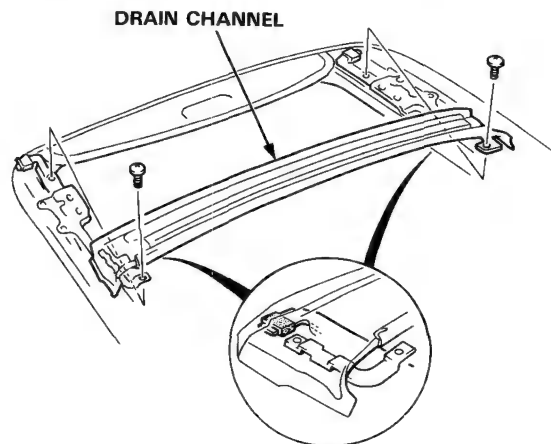
6. Install the glass in the reverse order of the removal procedure.
7. Check for water and air leaks.

NOTE: Do not use high pressure water.

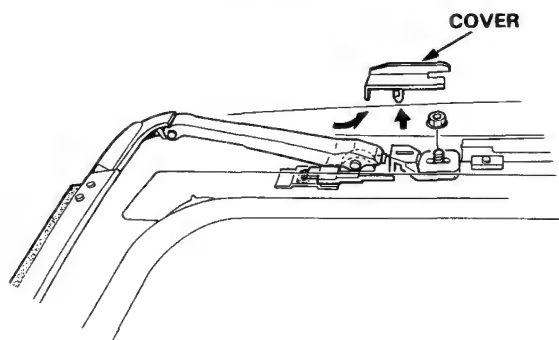
Sunroof

Glass Bracket/Sunshade Replacement

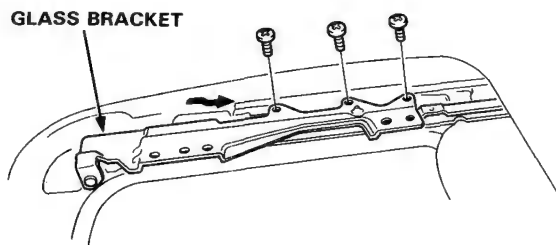
1. Remove the sliding glass (page 20-53).
2. Remove the screws and drain channel by sliding it forward.



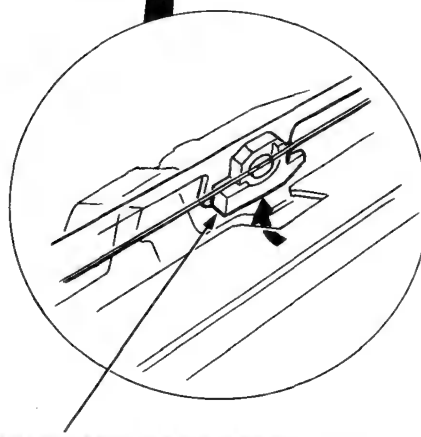
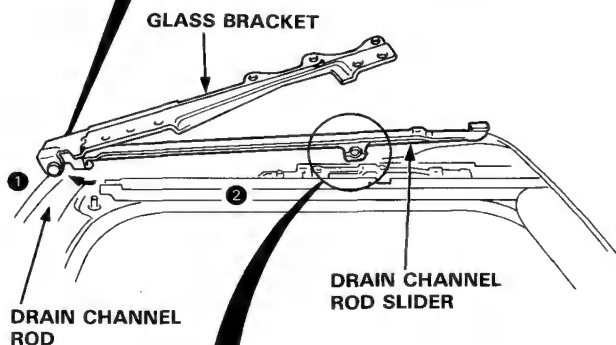
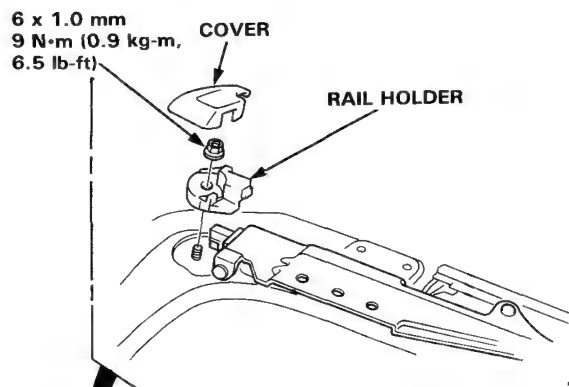
3. Remove the covers and mounting nuts. Remove the wind deflector by sliding it backward.



4. Using the sunroof wrench, move the glass bracket to the position where the sunroof normally pivots down and remove the mounting screws.



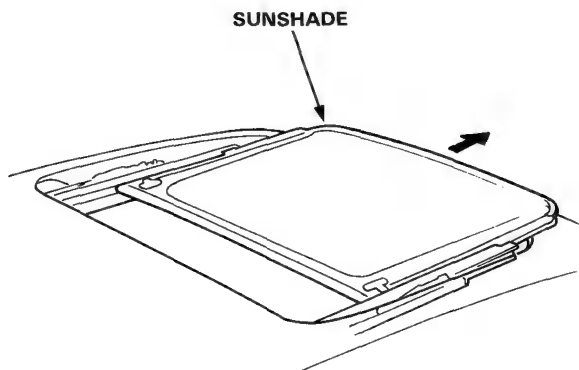
5. Remove the cover and mounting nut, then remove the guide rail holder.
6. Remove the drain channel rod slider by moving the cable slider forward using the sunroof wrench.
7. Detach the rain channel rod stopper from the cutout of the guide rail.



Rotate as shown to remove it from the guide rail.



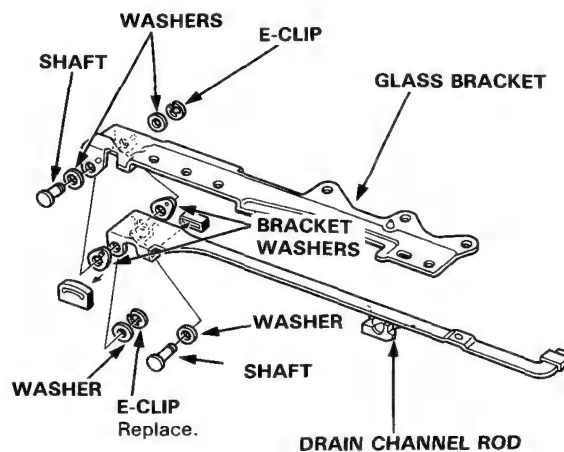
8. Slide the sunshade forward, then remove it.



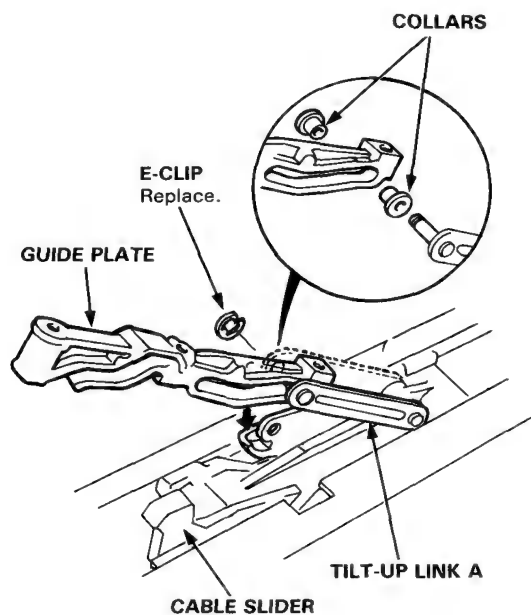
9. Install the sunshade in the reverse order of the removal procedure. Make sure it moves smoothly.

Drain Channel Rod/Guide Plate Replacement

1. Remove the glass bracket.
2. Pry the E-clips off and remove the shafts, then separate the glass bracket and drain channel rod.



3. Pry the E-clip off and remove the guide plate from the tilt-up link A.



4. Assemble the guide plate and drain channel rod in the reverse order of the removal procedure.

NOTE: Apply grease to the moving surface.

Sunroof

Motor, Drain Tube and Frame Replacement

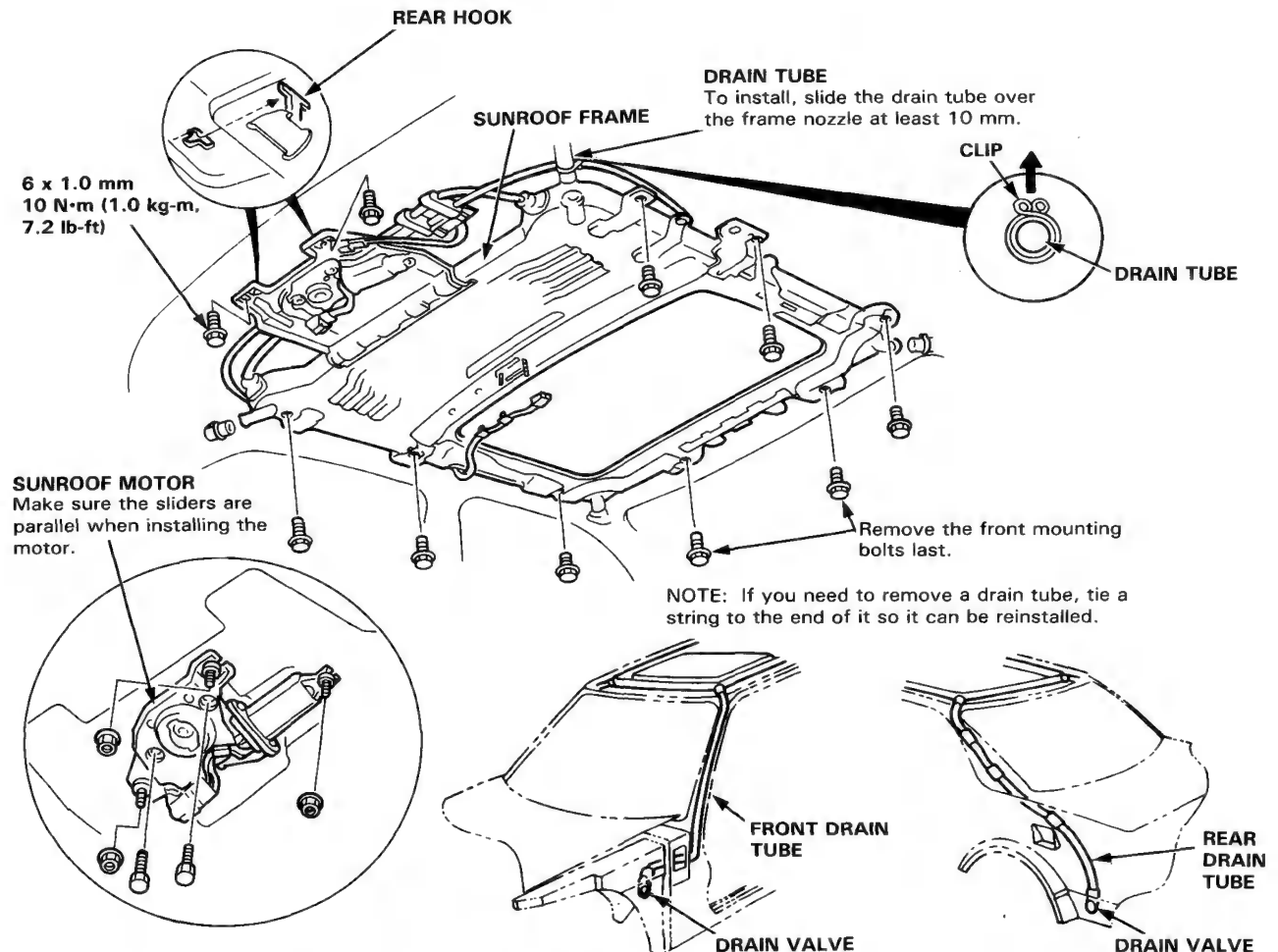
CAUTION: Be careful not to damage the seats, dashboard and other interior trim.

1. Remove the sliding glass (page 20-53) and the headliner (page 20-60).
2. Disconnect the motor and relay wire harness; remove the clips securing the ceiling light wire harness.

NOTE: When removing the sunroof motor, remove the 2 mounting bolts and 3 nuts.

3. Disconnect the drain tubes.
4. Remove the 10 mounting bolts and rear hooks, then remove the frame from the car.

NOTE: You may require assistance when removing the frame.



5. To install, insert the frame's rear hooks into the body holes, then install parts in the reverse order of the removal procedure.

NOTE:

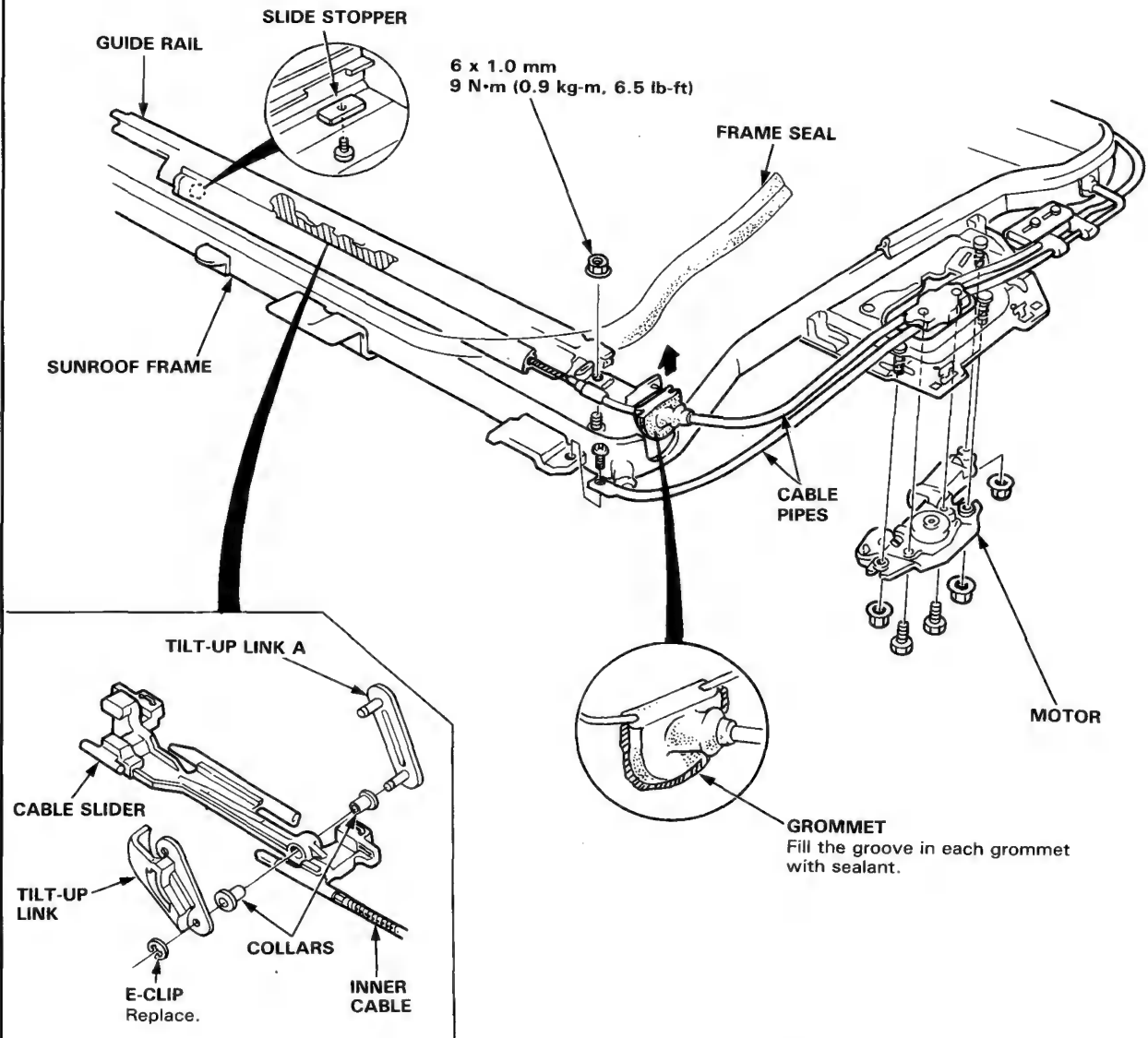
- Install the tube clips with the ends facing side to ease installation of the headliner.
- Clean the surface of sunroof frame.
- Check the drain seal assembly.
- Check for water and air leaks.



Guide Rails/Cable Replacement

1. With sunroof out of the car, remove the sunroof motor from the frame.
2. Remove the guide rail mounting nuts and lift off the guide rails, then remove the cables with sliders attached.

NOTE: Take care not to bend the cable pipes and guide rails.



3. Install the slider and tilt-up link in the reverse order of the removal procedure.

NOTE:

- Damaged parts should be replaced.
- Apply grease to the sliding portion.

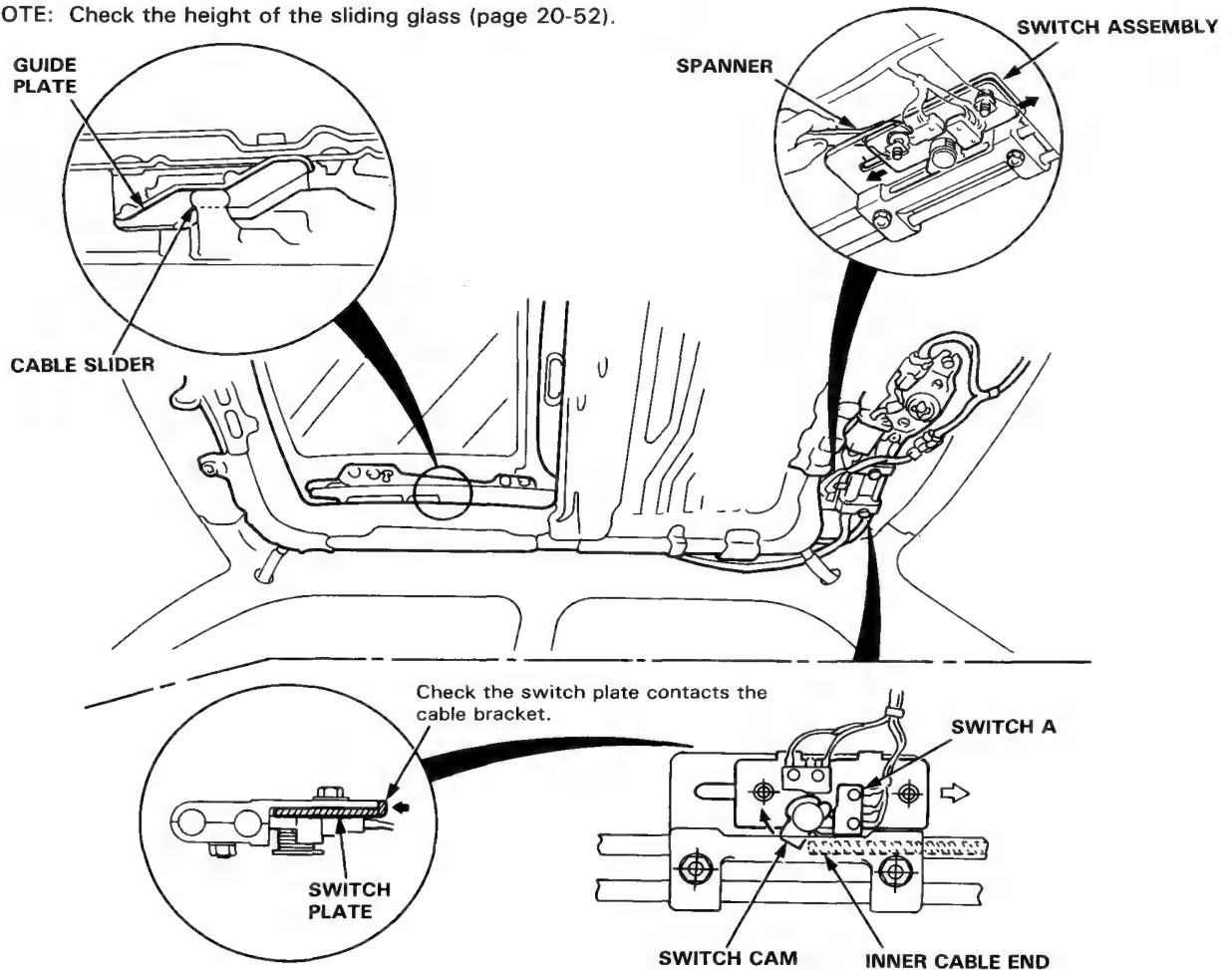
Sunroof

Slide Switch Adjustment (Fully Closed Position)

1. Remove the headliner (page 20-60).
2. Using the sunroof wrench, close the glass fully.

NOTE: Check the sliding glass fit to the roof panel (page 20-52).
3. Using the spanner, loosen the switch plate mounting bolts.
4. Adjust position of the slide switch (switch cam) as shown.
5. Check the operation of the sliding glass (from tilt-up position to fully closed position, from fully open position to fully closed position) by operating the sunroof switch.

NOTE: Check the height of the sliding glass (page 20-52).



6. Close the sliding glass fully and check for water and air leaks.

NOTE: Do not use high pressure water.

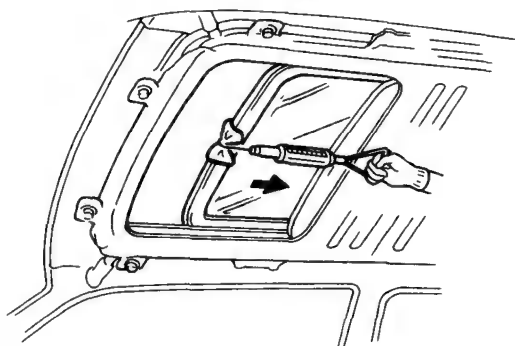


Closing Drag Check (Motor Removed)

Before installing the sunroof motor, measure effort required to open sliding glass using a spring scale as shown.

CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop towel.

If load is over 98 N (10 kg, 22 lb), check side clearance and glass height adjustment (page 20-52).

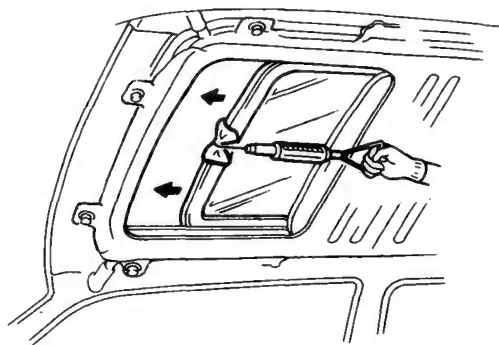


Closing Force Check (Motor Installed)

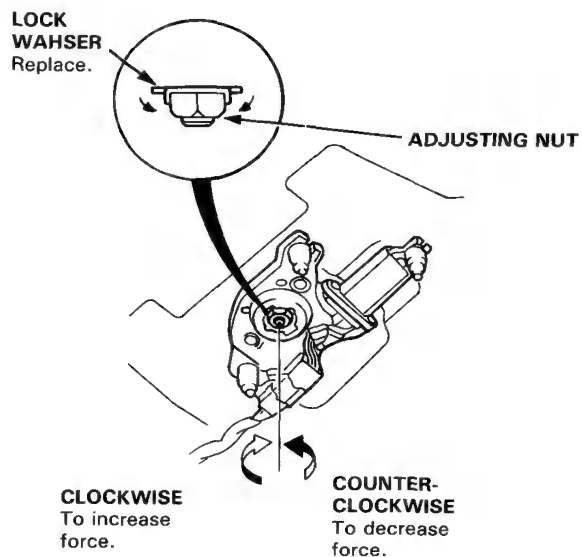
1. After installing all removed parts, have a helper hold the switch to close the sliding glass while you measure force required to stop it. Attach a spring scale as shown. Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop towel.

Closing Force: 196–245 N
(20–30 kg, 44–55 lb)



2. If the force is not within specification, install a new lockwasher, adjust the tension by turning the sunroof motor clutch adjusting nut, and bend the lock washer against the adjusting nut.



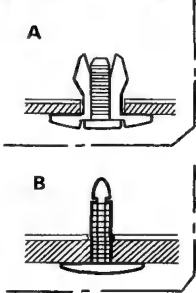
Headliner

Replacement

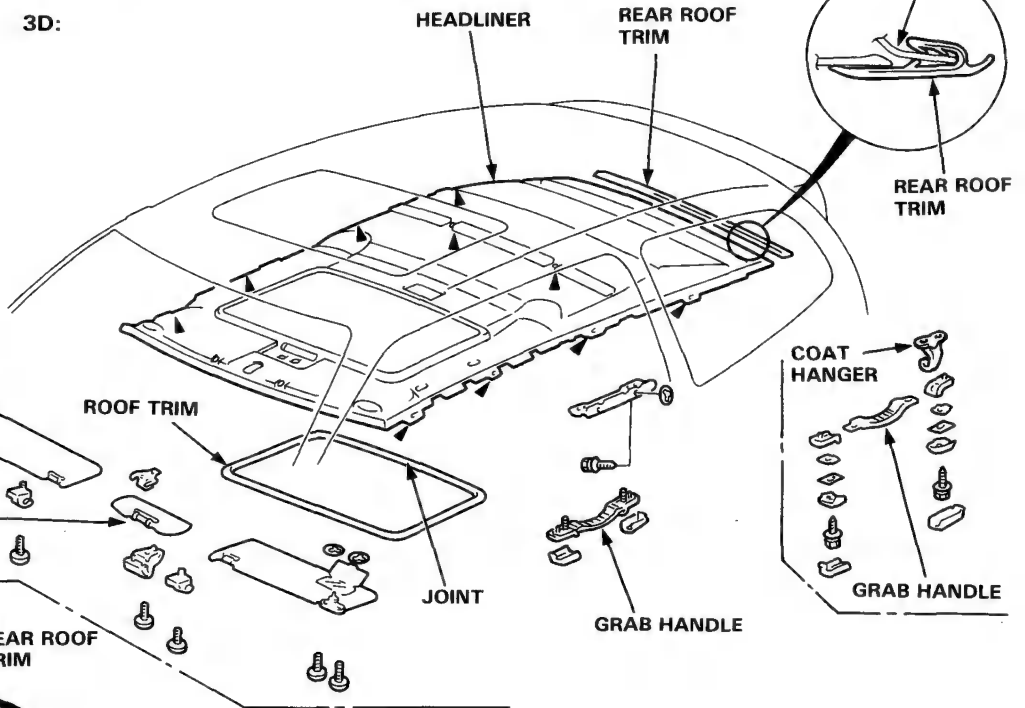
Remove:

- Sunvisors and center visor
- Rearview mirror assembly (page 20-25)
- Front pillar trim (pages 20-61, 62, 63)
- Rear pillar trim (pages 20-61, 62, 63)

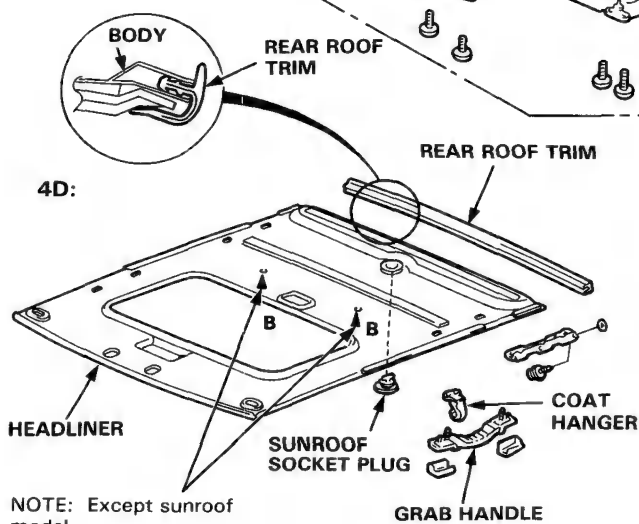
►: Clip locations



3D:



4D:



NOTE: Except sunroof model.

- Roof trim and sunroof socket plug
- Grab handles
- Front seat (4D) (page 20-64)
- Rear seat (4D) (pages 20-70, 71, 72)

Remove the headliner from:

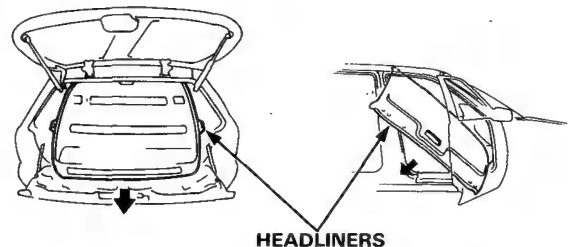
- 3D: Tailgate opening
- 4D: Passenger's side door opening

NOTE:

- Take care not to bend the headliner.
- Keep water away from the headliner.
- Be careful not to damage the dashboard and other interior trim.

3D:

4D:



Installation is the reverse of the removal procedure.

NOTE:

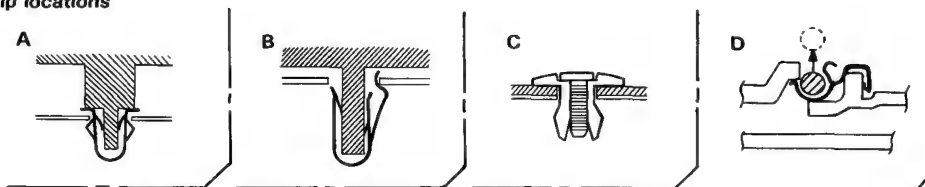
- When installing the headliner, be careful not to fold or bend it. Also, be careful not to scratch the body.
- Check that both sides of the headliner are securely attached to the trim.
- When installing the roof trim, install the joint towards the rear.



Interior Trim

(3D) Replacement

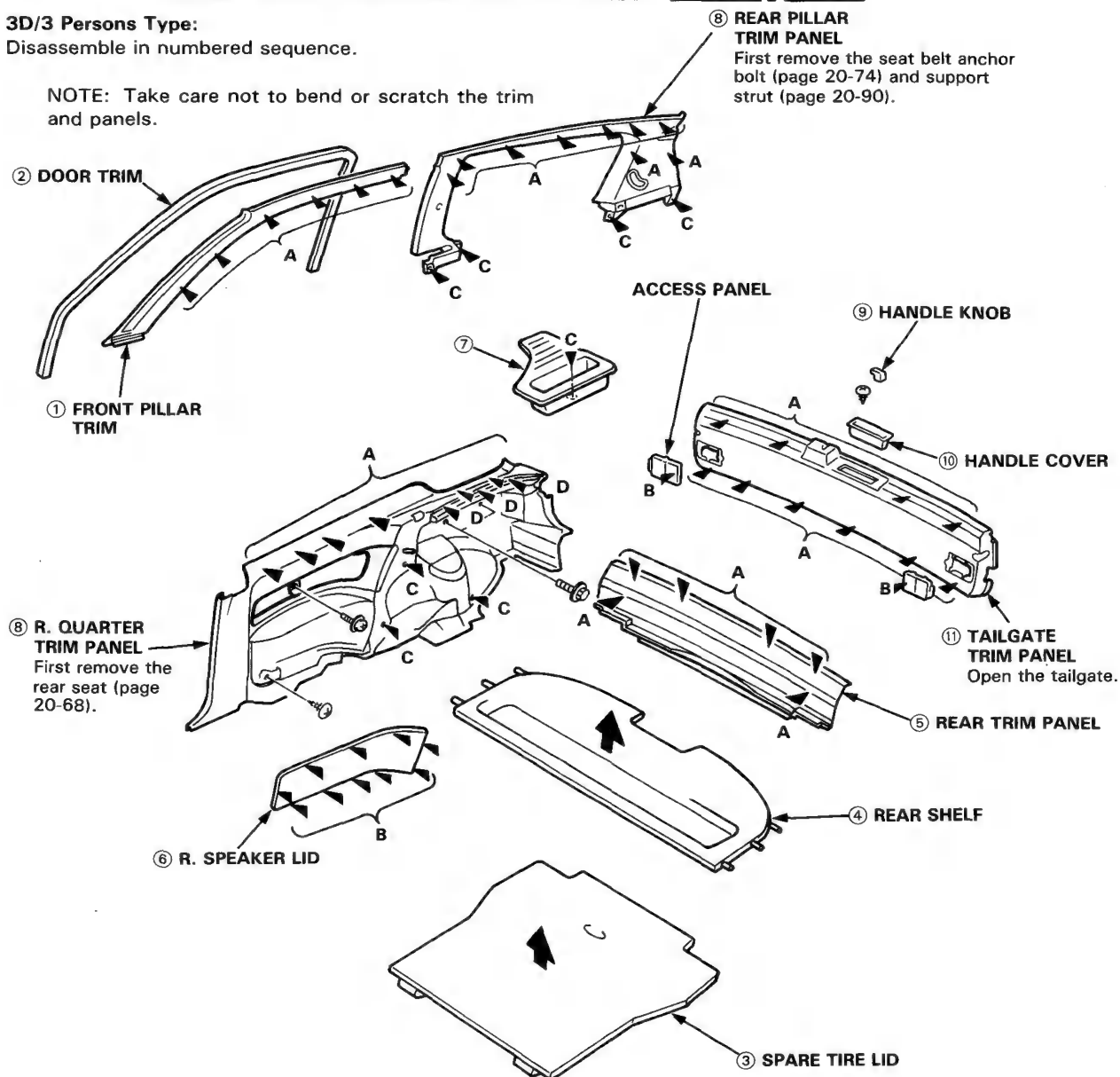
►: Clip locations



3D/3 Persons Type:

Disassemble in numbered sequence.

NOTE: Take care not to bend or scratch the trim and panels.



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

(cont'd)

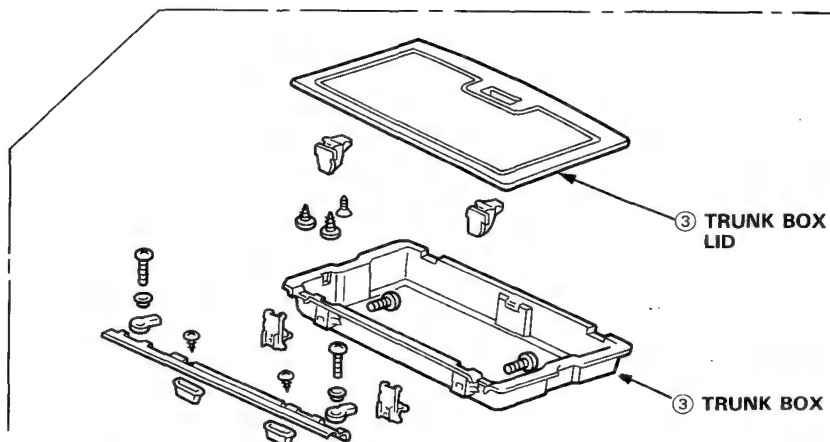
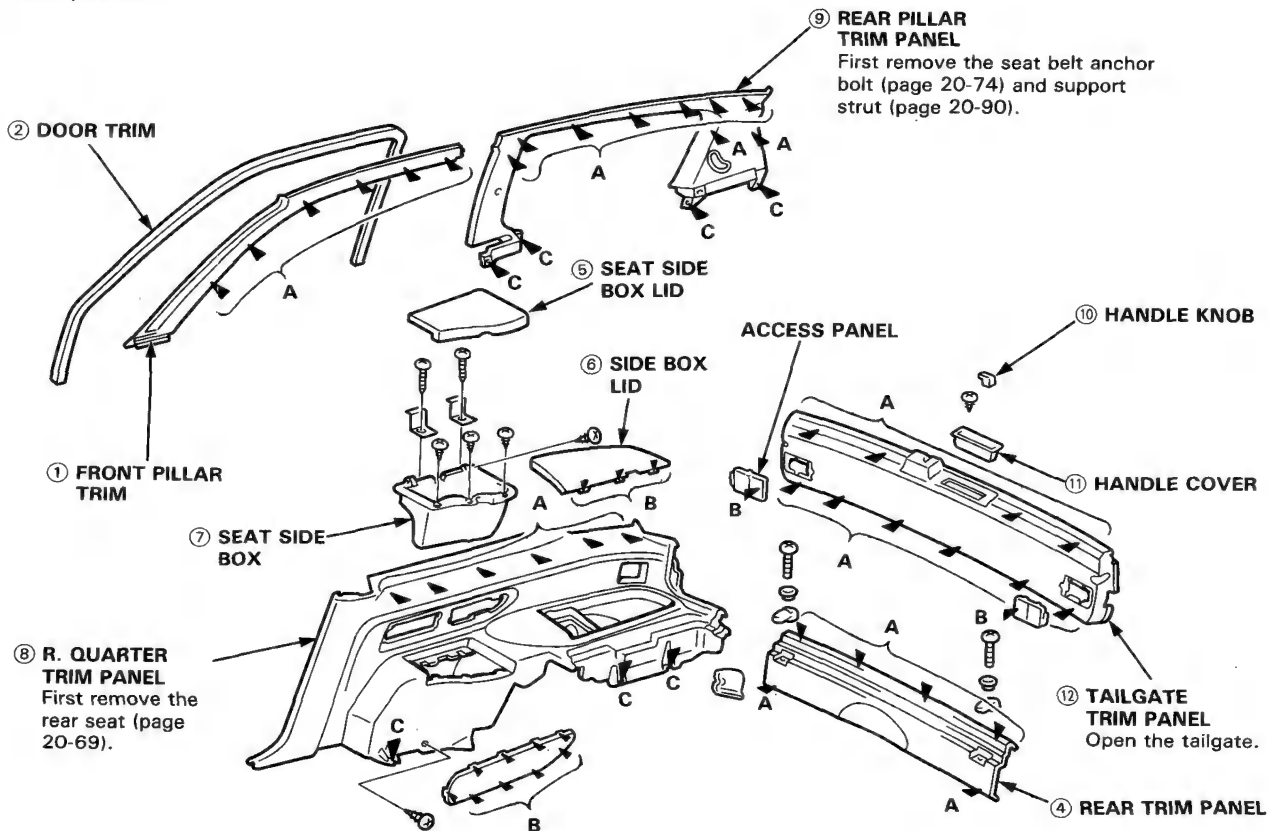
Interior Trim

(3D) Replacement (cont'd)

3D/2 Persons Type:

Disassemble in numbered sequence.

NOTE: Take care not to bend or scratch the trim and panels.



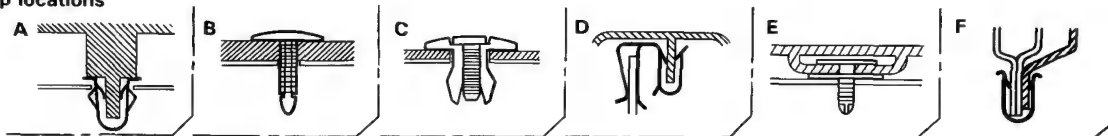
Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.



(4D) Replacement

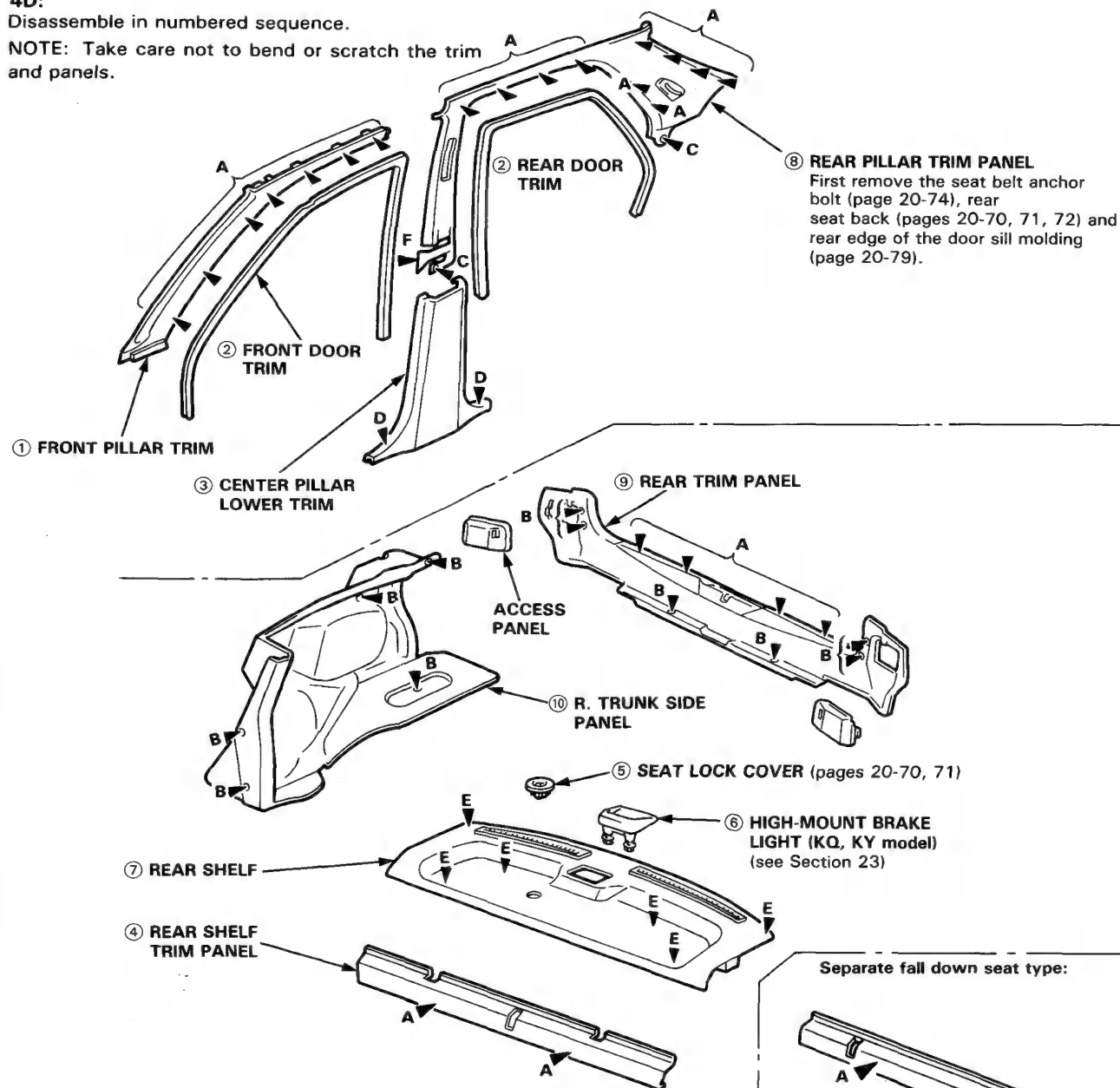
►: Clip locations



4D:

Disassemble in numbered sequence.

NOTE: Take care not to bend or scratch the trim and panels.



Installation is the reverse of the removal procedure.

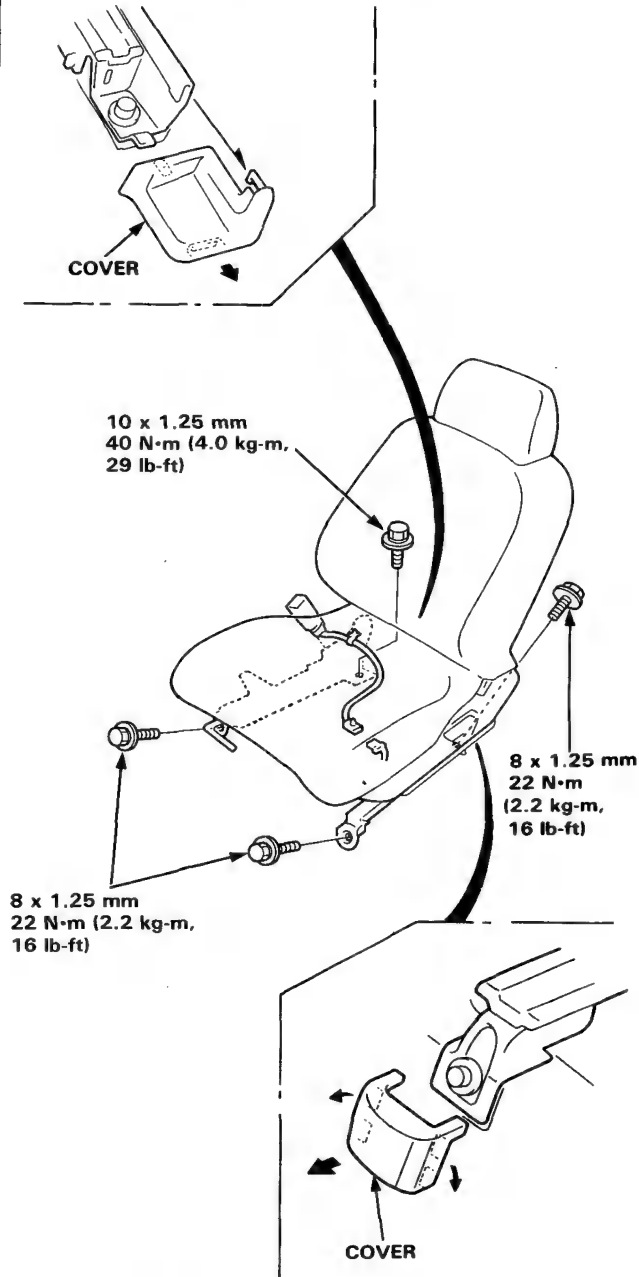
NOTE: If necessary, replace any damaged clips.

Front Seats

Removal

NOTE: Take care not to scratch the seat covers and body.

1. Remove the seat track end covers as shown.
2. Remove the mounting bolts and disconnect the connectors, then remove the seat assembly.



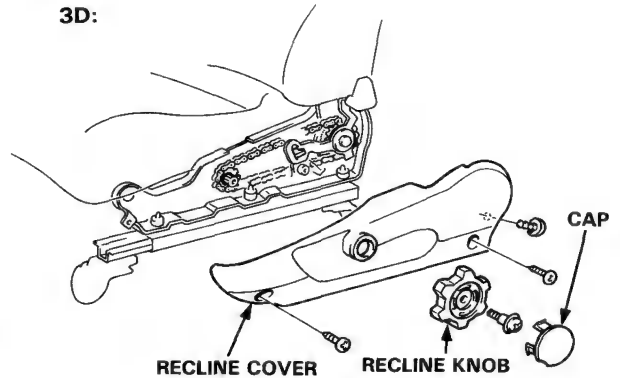
3. Installation is the reverse of the removal procedure.

Replacement

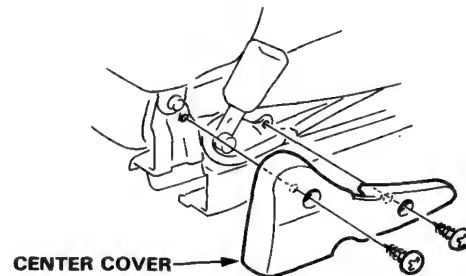
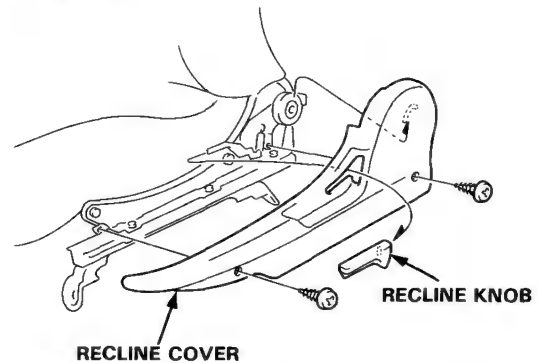
NOTE: Take care not to scratch the seat covers and body.

1. Remove the seat assembly, then take it out from the door opening.
2. Remove the screws and recline knob, then remove the recline cover.
Remove the screws, then remove the center cover.

3D:

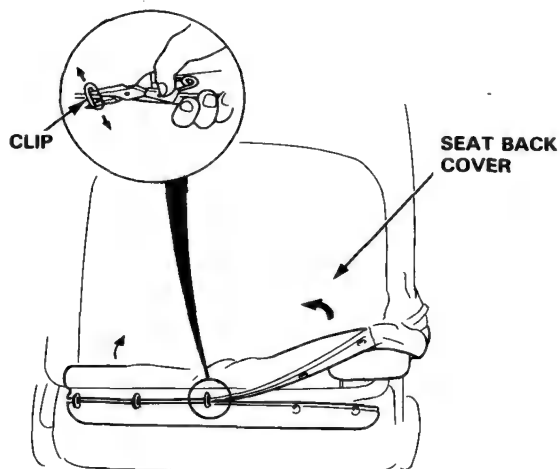


3D/4D:





3. Remove the lower clips from the seat back, then fold the seat cover back.

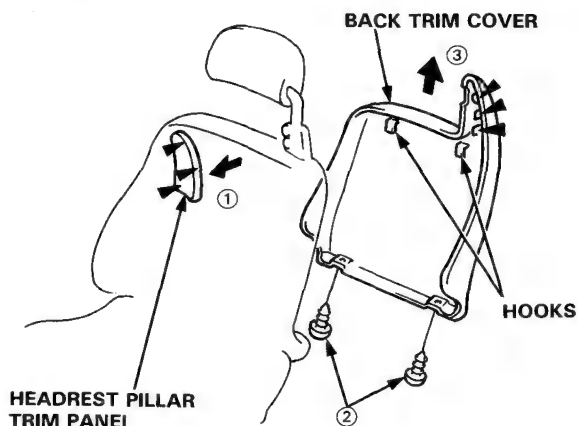


Trim Cover Type (3D):

Remove the screws and clips, then remove the back cover.

NOTE: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

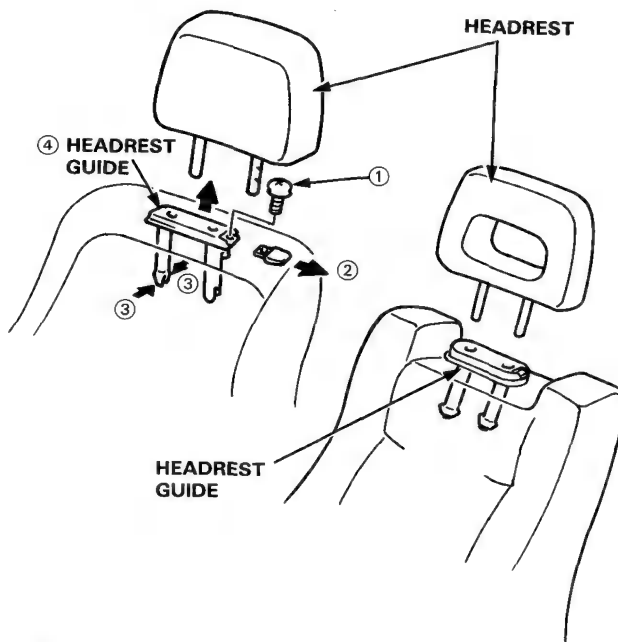
►: Clip locations



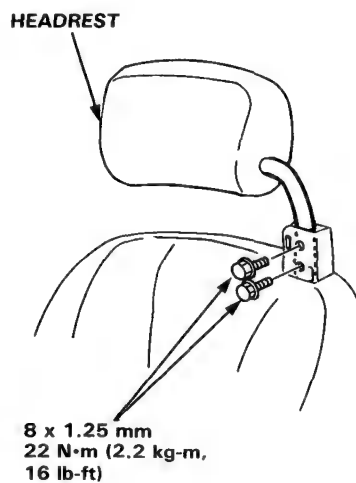
NOTE: Take care not to scratch the trim panel.

4. Remove the headrest.

Adjustable Type (3/4D):



Fixed Type (3D):



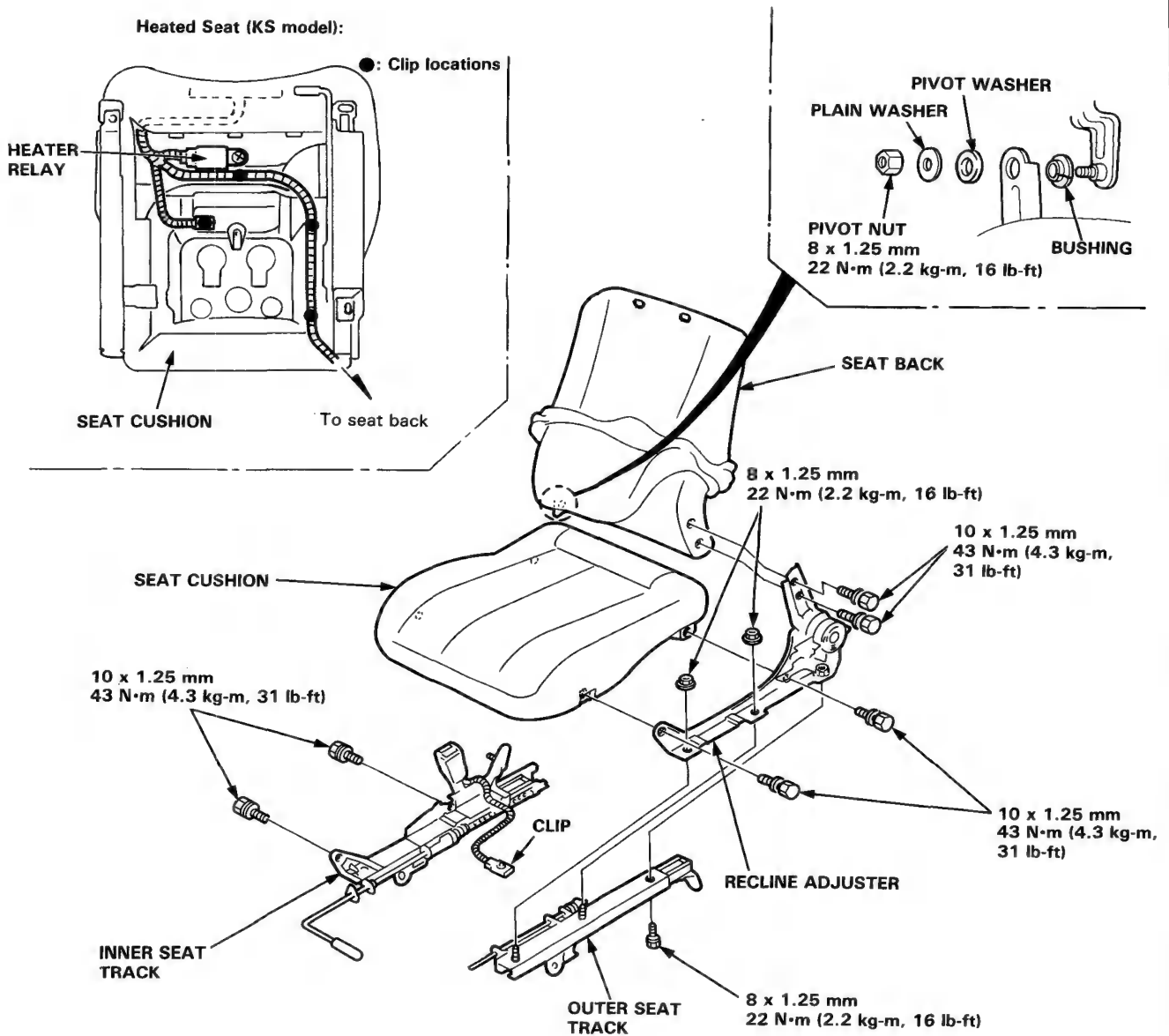
22 N·m (2.2 kg-m,
16 lb-ft)

(cont'd)

Front Seats

Replacement (cont'd)

- Remove the seat back and seat cushion from the seat track.



- Installation is the reverse of the removal procedure.

NOTE:

- To prevent wrinkles when installing a seat back cover, make sure the material is stretched evenly over the frame before securing all the clips.
- Apply grease to the moving surfaces.



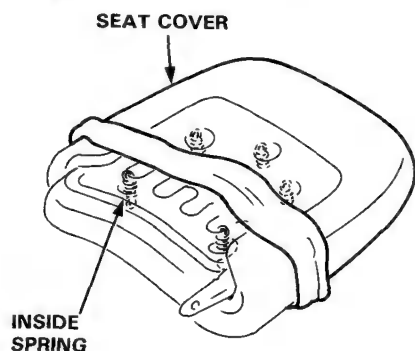
Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat cover.

NOTE: Take care not to tear the seams or damage the cover.

Seat back cover removal.

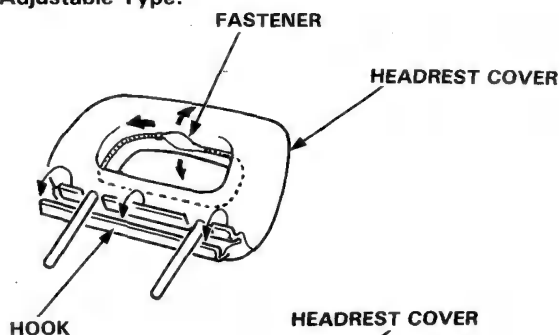
1. Remove the seat back from the seat track and recline adjuster (page 20-66).
2. Remove the headrest and headrest guide (page 20-65).
3. Remove the seat cover by releasing all the inside springs.



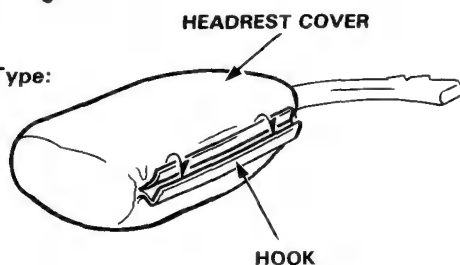
Headrest cover removal.

1. Remove the headrest from the seat back (page 20-65).
2. Remove the hook and fastener, then pull back the cover.

Adjustable Type:

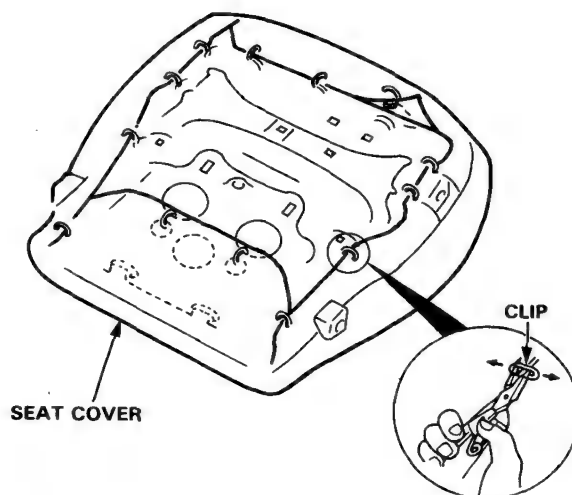


Fixed Type:



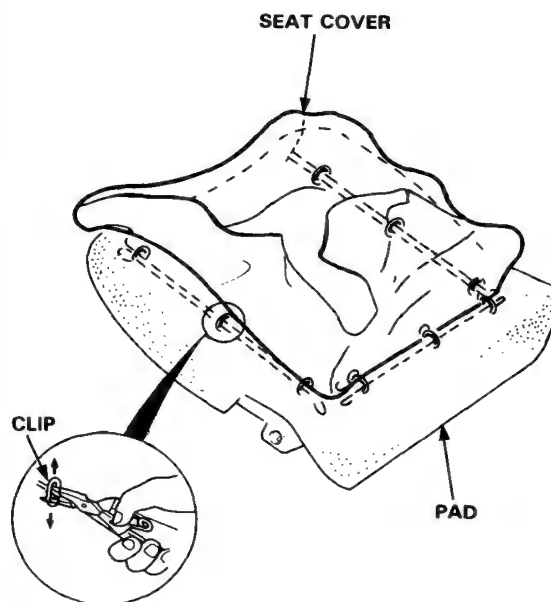
Seat cushion cover removal.

1. Remove the seat cushion from the seat tracks (page 20-66).
2. Remove all hooks and clips from under the seat cushion, then loosen the seat cover.



3. Pull back the edge of the seat cover all the way around, then release the pad clips.

NOTE: To prevent wrinkles when installing a seat cover, make sure the material is stretched evenly over the frame before securing all the clips.



Rear Seats

(3D) Replacement

3D/3 Persons Type:

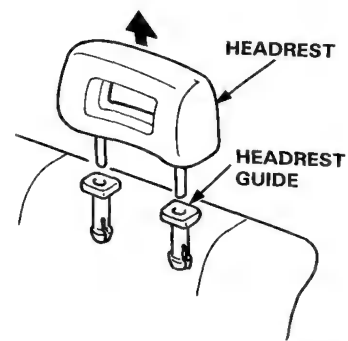
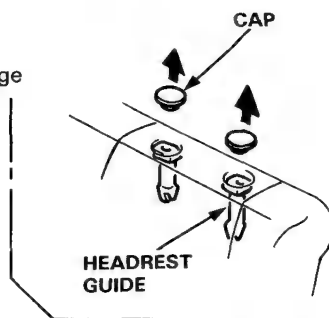
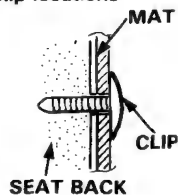
<DX, VEi, DXi, LSi>

<ESi>

Disassemble in numbered sequence.

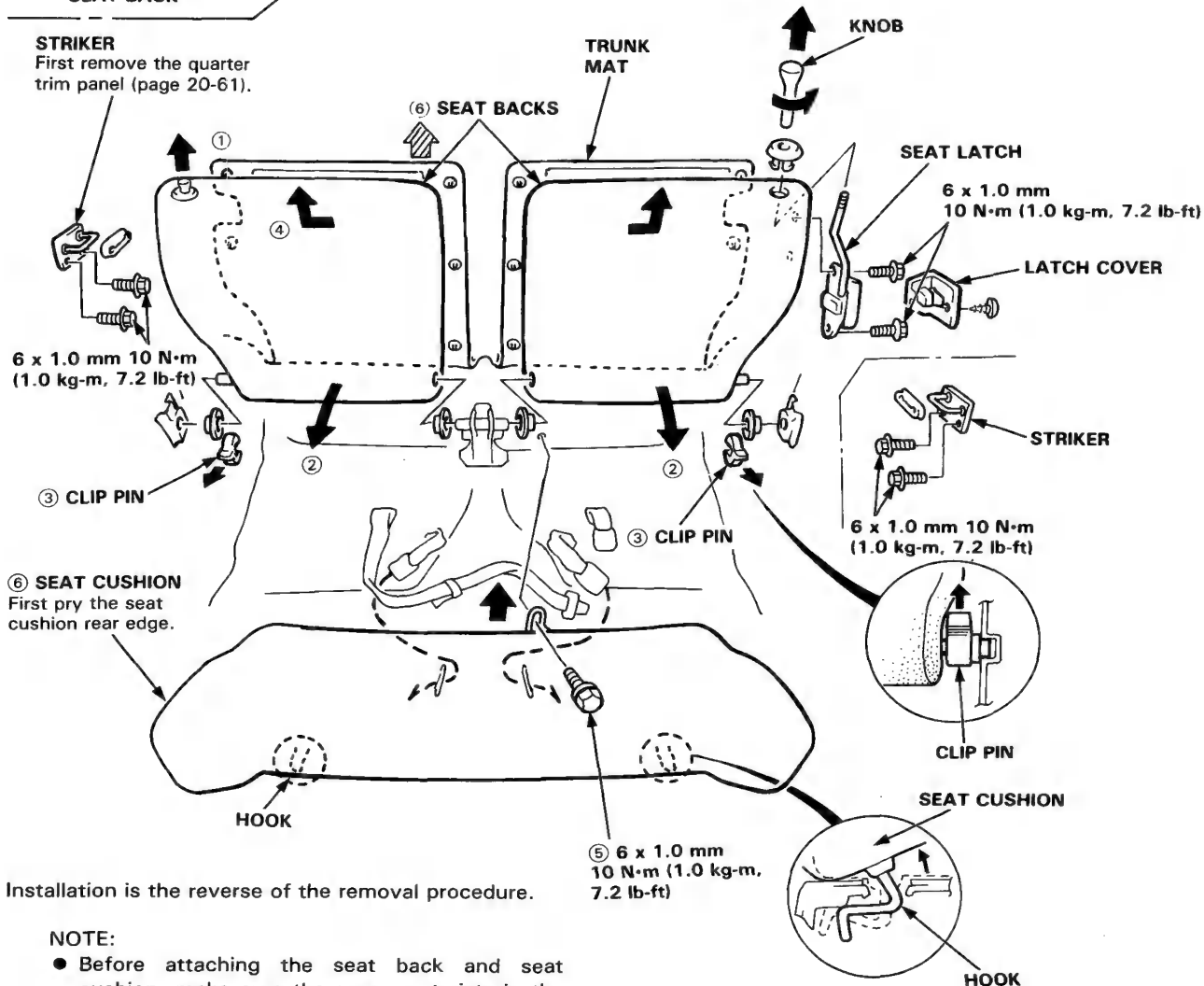
NOTE: Take care not to tear the seams or damage the cover and trunk mat.

● : Clip locations



STRIKER

First remove the quarter trim panel (page 20-61).



Installation is the reverse of the removal procedure.

NOTE:

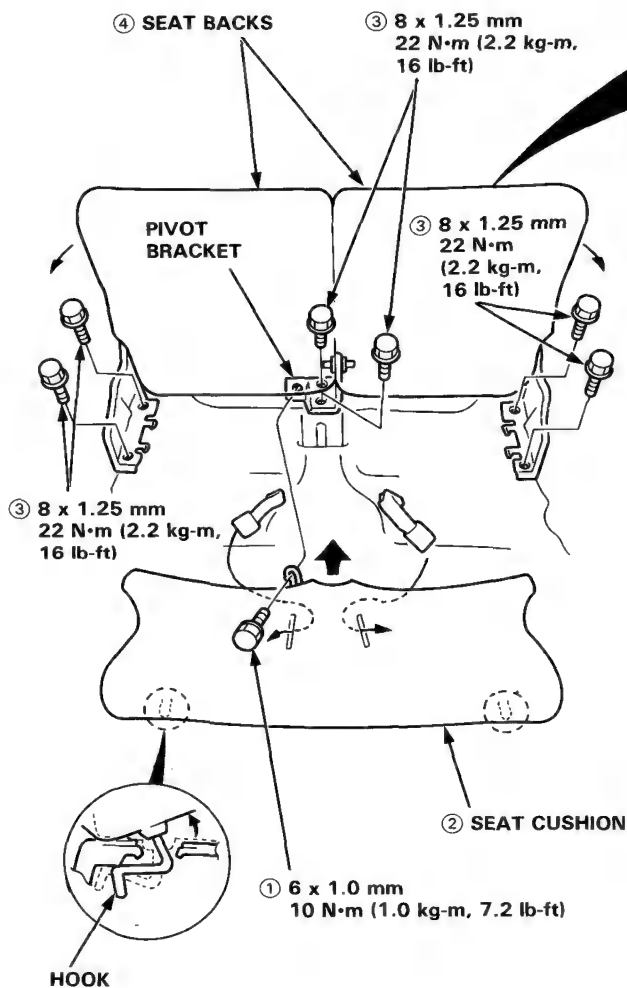
- Before attaching the seat back and seat cushion, make sure there are no twists in the seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the seat belts.



3D/2 Persons Type (VTi):

Disassemble in numbered sequence.

NOTE: Take care not to tear the seams or damage the cover and trunk mat.



Installation is the reverse of the removal procedure.

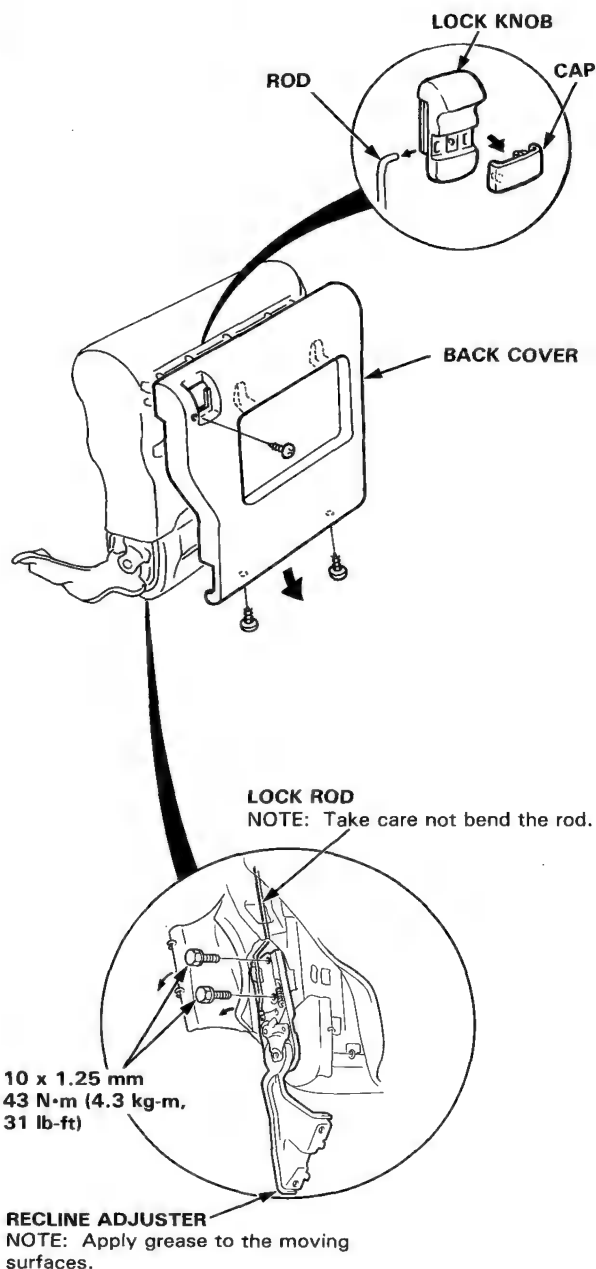
NOTE:

- Before attaching the seat back and seat cushion, make sure there are no twists in the seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the seat bleets.

Recline adjuster replacement.

1. Remove the lock knob, then remove the back cover.
2. Pull back the cover, then remove the recline adjuster.

NOTE: Before installing the seat, make sure the recline adjuster reclining mechanism functions.



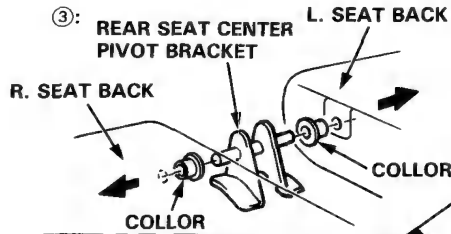
Rear Seats

(4D) Replacement

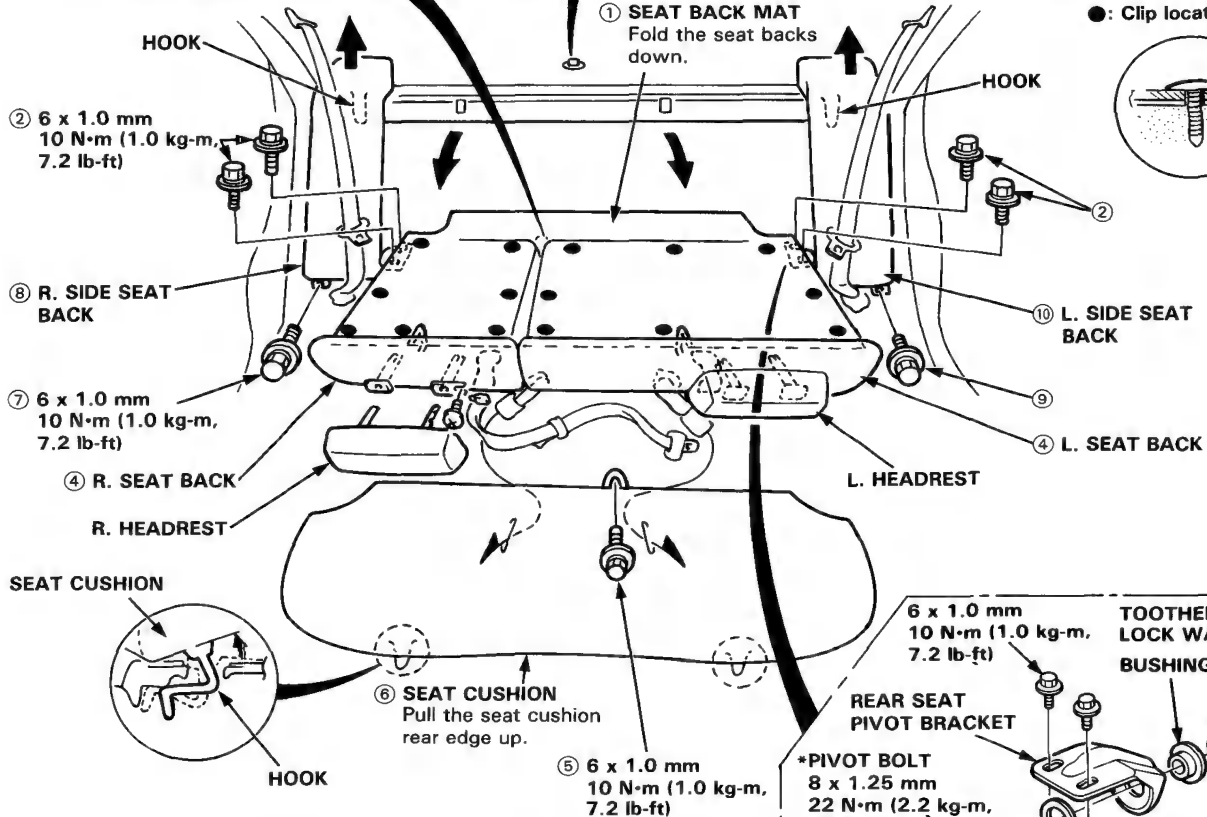
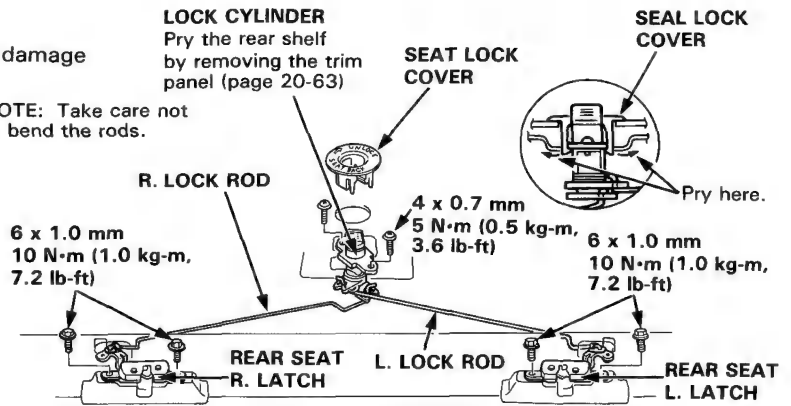
Disassemble in numbered sequence.

NOTE: Take care not to tear the seams or damage the cover.

4D/3 Persons Type:
(Separate fall down type)



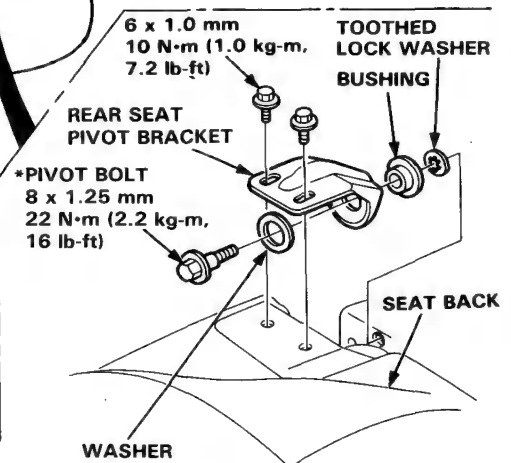
NOTE: Take care not to bend the rods.



Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the seat back and seat cushion, make sure there are no twists in the seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the seat belts.
- On reassemble, replace the pivot bolt (*) and use liquid thread lock.

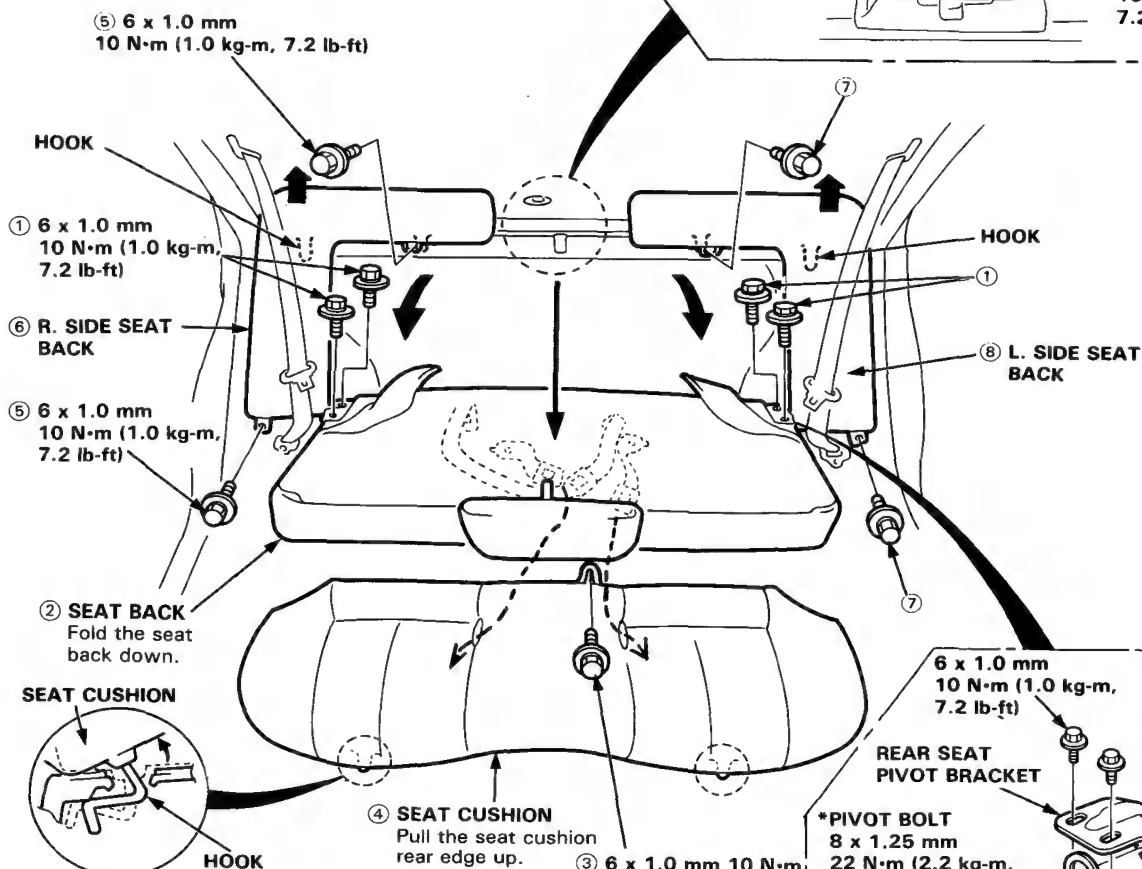
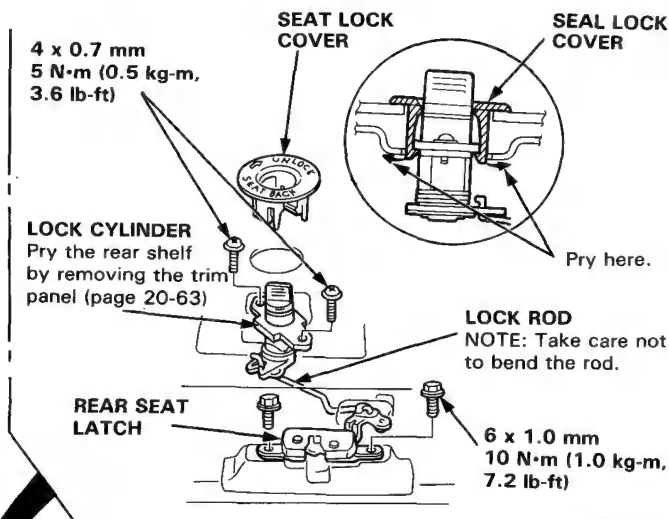




Disassemble in numbered sequence.

NOTE: Take care not to tear the seams or damage the cover.

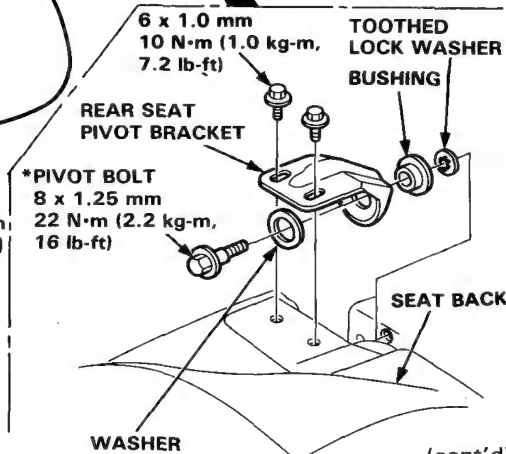
4D/3 Persons Type:
(One piece fall down type)



Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the seat back and seat cushion, make sure there are no twists in the seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the seat belts.
- On reassembly, replace the pivot bolt (*) and use liquid thread lock.



(cont'd)

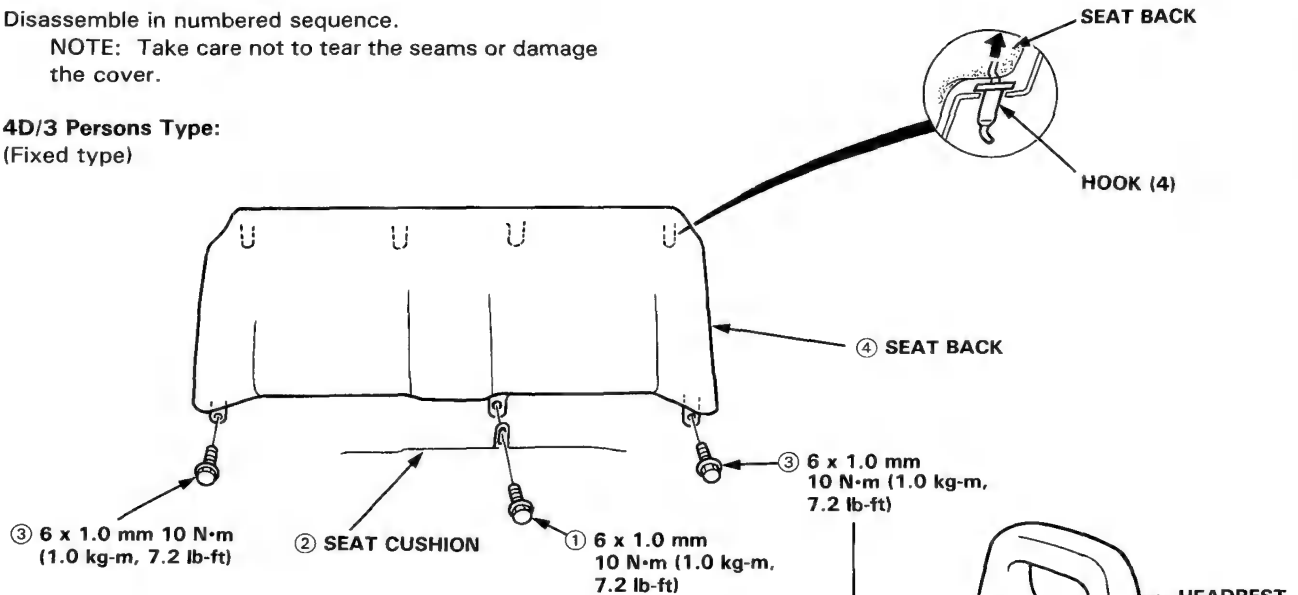
Rear Seats

(4D) Replacement (cont'd)

Disassemble in numbered sequence.

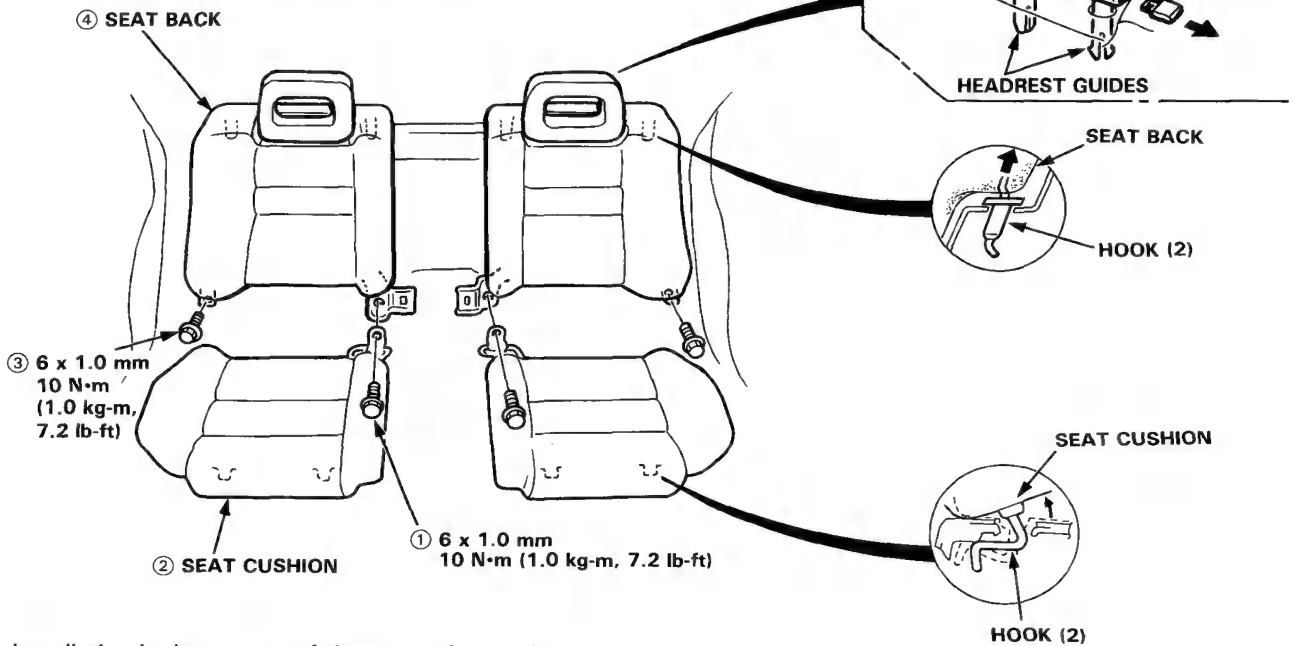
NOTE: Take care not to tear the seams or damage the cover.

4D/3 Persons Type: (Fixed type)



4D/2 Persons Type: (Sports seat)

NOTE: Remove the rear seat center console (page 20-73).



Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the seat back and seat cushion, make sure there are no twists in the seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the seat belts.



Rear Sest Center Console

Replacement

NOTE: Take care not to tear the seams or damage the cover.

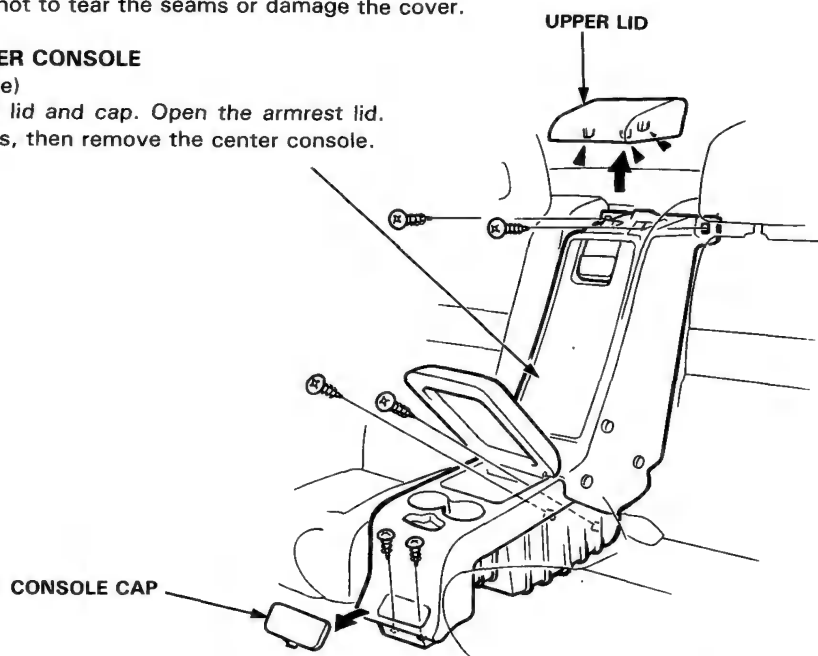
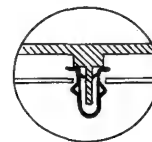
REAR SEAT CENTER CONSOLE

(4D/2 Persons Type)

Remove the upper lid and cap. Open the armrest lid.

Remove the screws, then remove the center console.

►: Clip locations



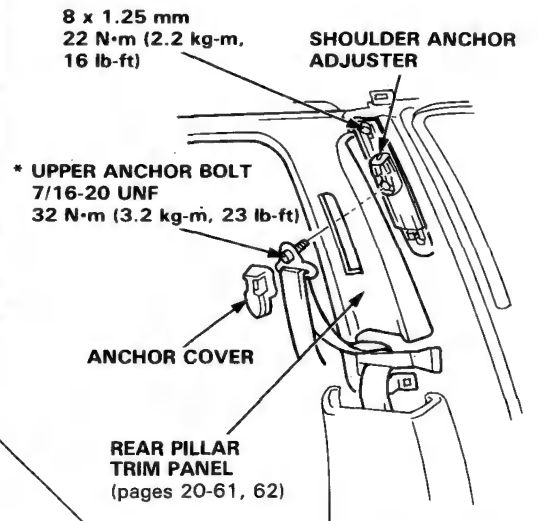
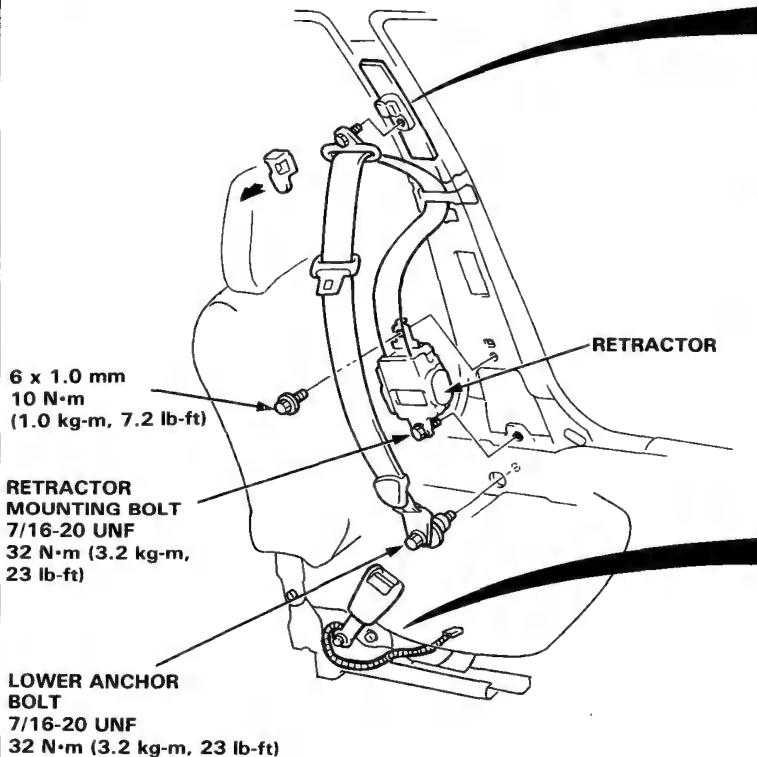
Installation is the reverse of the removal procedure.

Seat Belts

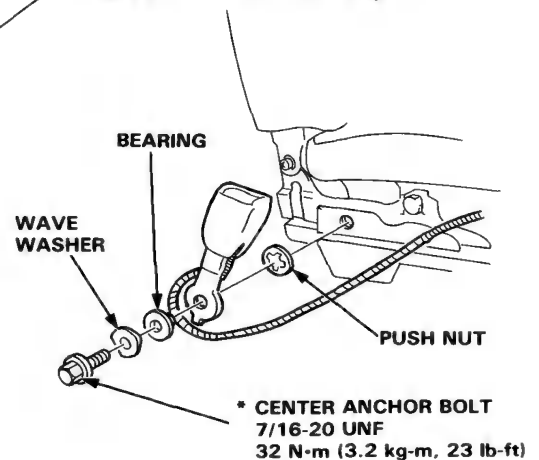
Front Replacement

CAUTION: Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove the center pillar lower trim (4D) (page 20-63) and quarter trim panel (3D) (pages 20-61, 62).
2. Remove the upper anchor bolt, lower anchor bolt and retractor bolt with a 17 mm socket or box-end wrench.
3. Remove the front seat, then remove the bolt and the center anchor.

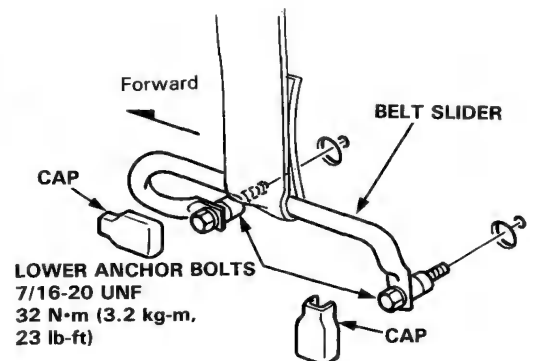
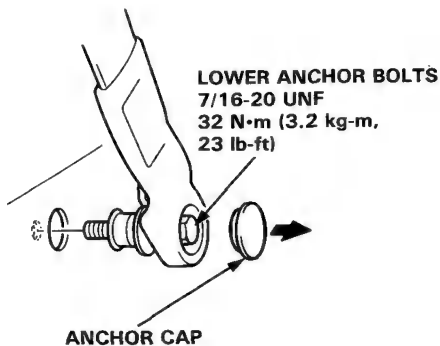
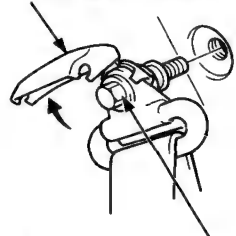


Remove the center cover (page 20-60).



3D:

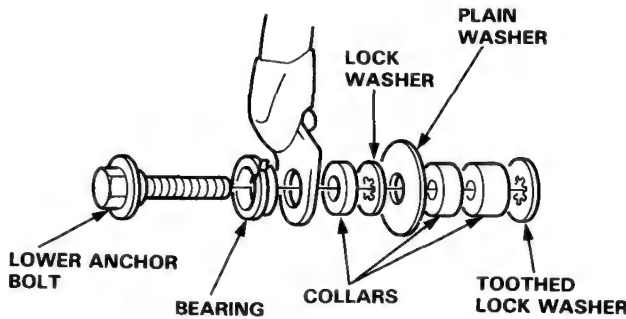
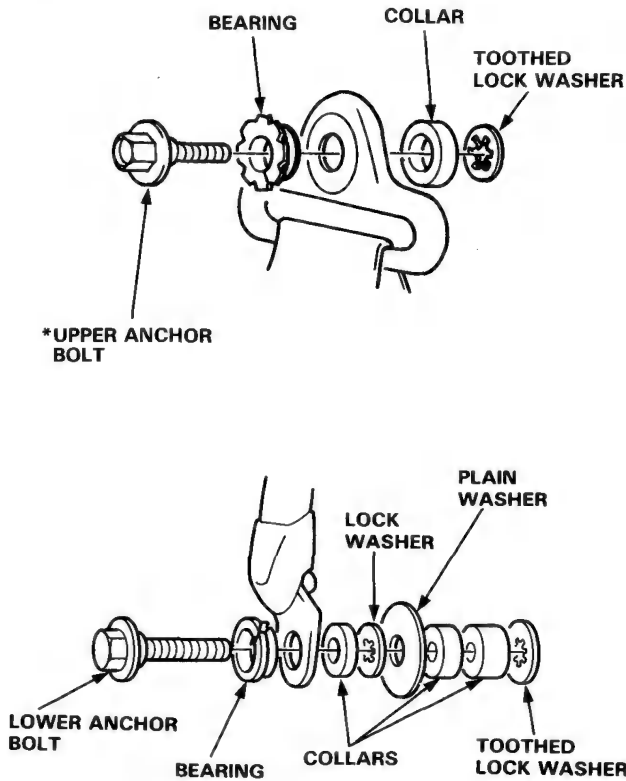
Pry the anchor cover.



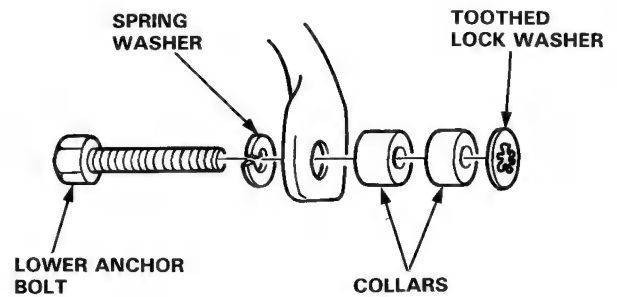
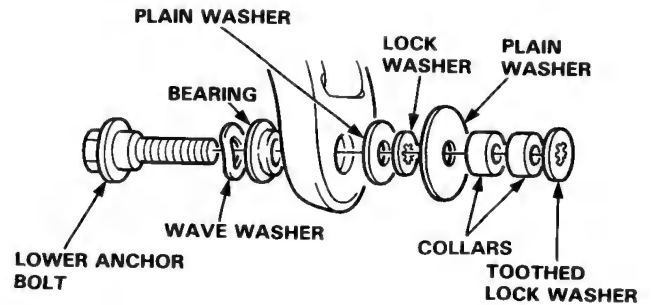
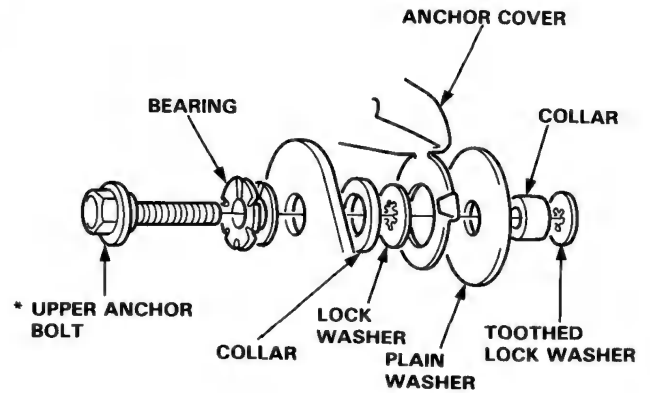


Anchor bolt construction:

4D:



3D:



4. Check that the retractor locking mechanism functions as described on page 20-77.
5. Installation is the reverse of the removal procedure.

NOTE:

- Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
- Before attaching the rear pillar trim panel, make sure there are no twists or kinks in the belts.
- On reassembly, replace the upper anchor bolt and center anchor bolt (*) and use liquid thread lock.

Seat Belts

Rear Replacement

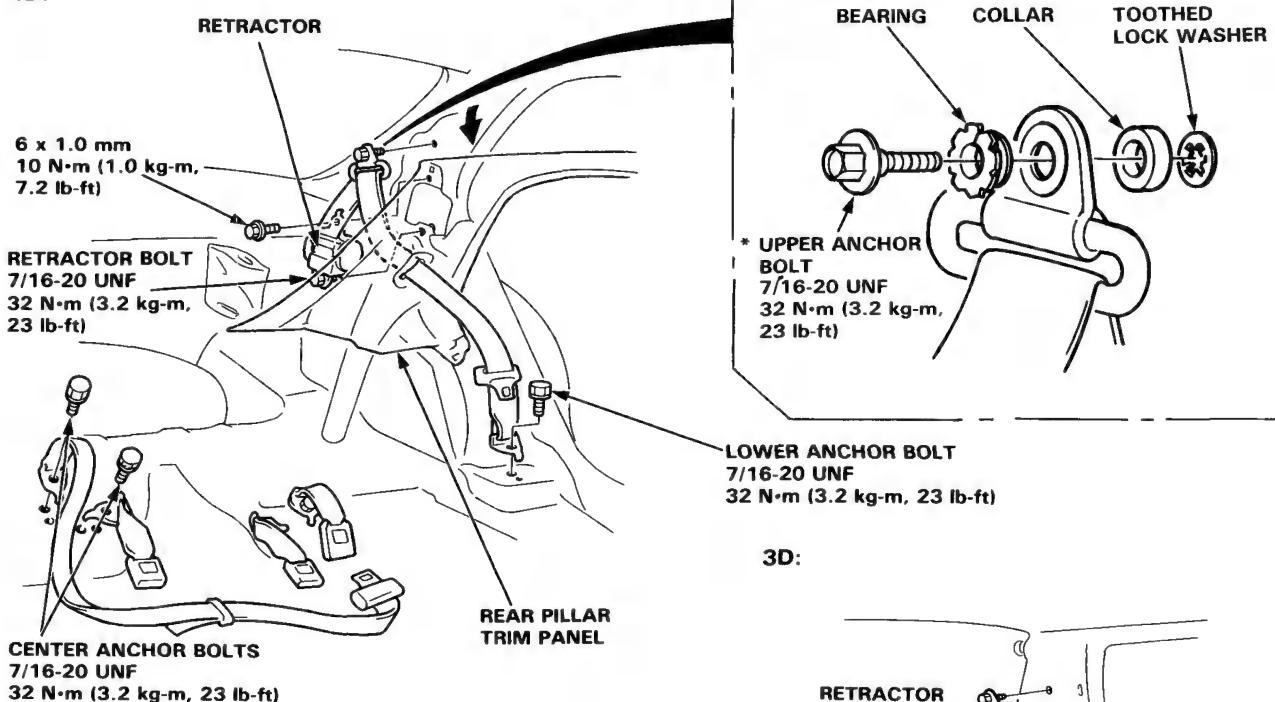
CAUTION: Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove:

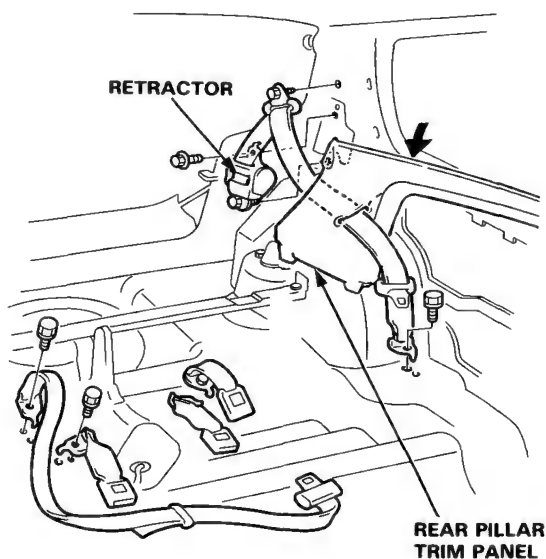
- Rear seat (pages 20-68, 69, 70, 71, 72)
- Rear shelf (4D) (page 20-63)
- Quarter trim panel (3D) (pages 20-61, 62)
- Rear pillar trim panel (pages 20-61, 62, 63)

2. Remove the upper anchor bolt, lower anchor bolt and retractor bolt with a 17 mm socket or box-end wrench.

4D:



3D:



3. Check that the retractor locking mechanism function as described on page 20-77.
4. Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the rear pillar trim panel and rear seat, make sure there are no twists in the belt.
- On reassembly, replace the upper anchor bolt (*) and use liquid thread lock.



Inspection

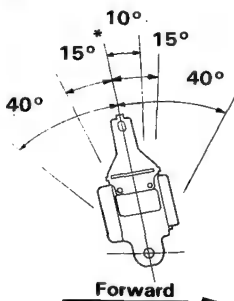
Retractor Inspection

1. With the retractor installed, check that the belt can be pulled out freely.
2. Make sure that the belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The belt should lock when the retractor is leaned over 40° .

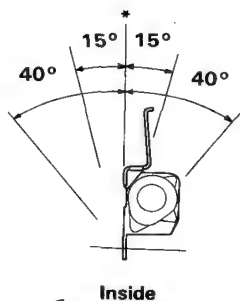
CAUTION: Do not attempt to disassemble the retractor.

4D:

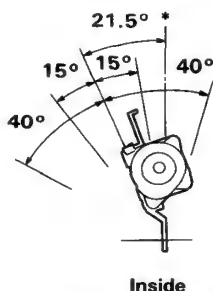
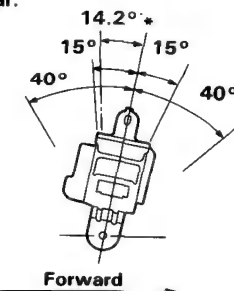
Front:



*: Mounted Position

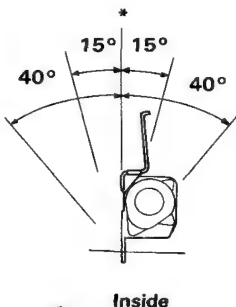
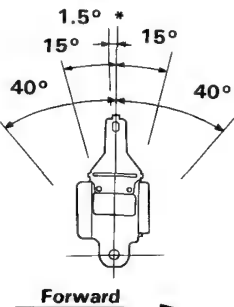


Rear:

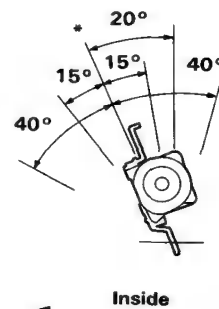
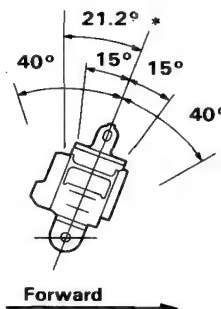


3D:

Front:



Rear:



3. Replace the belt assembly with a new one if there is any abnormality.

On-the-Car Belt Inspection

1. Check that the belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on its retaining bolt. If necessary, remove the bolt and check that the washers and other parts are not damaged or improperly installed.
3. Check the belts for damage or discoloration. Clean with a shop towel if necessary.

CAUTION: Use only soap and water to clean.

NOTE: Dirt build-up in the metal loops of the seat belt anchors can cause the belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.

4. Check that the belt does not lock when pulled out slowly. The belt is designed to lock only during a sudden stop or impact.
5. Make sure that the belt will retract automatically when released.
6. Replace the belt assembly with a new one if there is any abnormality.

Carpet

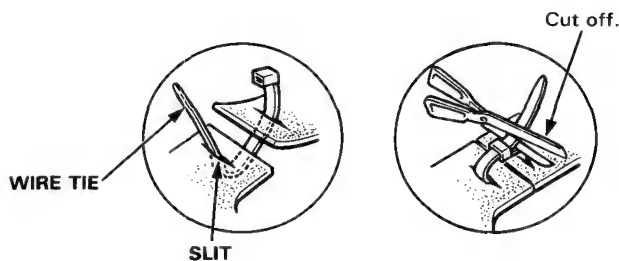
Replacement

1. Remove:

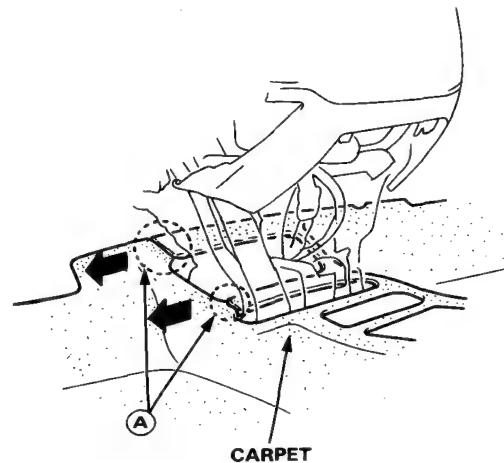
- Front seats (page 20-64)
- Rear seat back and rear seat cushion (pages 20-68, 69, 70, 71, 72)
- Center console and rear console (page 20-80)
- Center lower cover (page 20-80)
- Front seat belt lower anchor (page 20-74)
- Center pillar lower trim (4D) (page 20-63)
- Front seat belt retractor (4D) (page 20-74)
- Footrest

2. Pry out the clips and detach the door sill molding clips. Remove the hooks at the bottom of the center pillars (4D).

3. Cut the (A) area first, then pull the carpet back as shown.



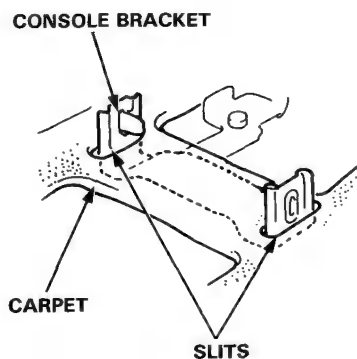
NOTE: When installing, reattach the cut area with a wire tie as shown.



4. Remove the carpet by sliding it rearward.

NOTE:

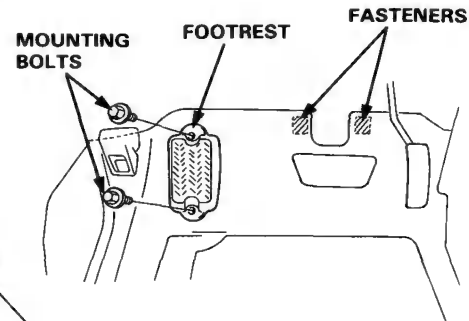
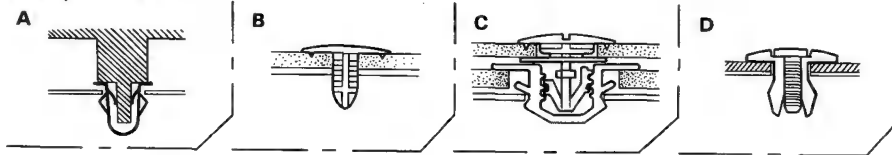
- Take care not to damage, wrinkle or twist the carpet.
- Remove the slits in the carpet from the console bracket (4D, 2WD only).



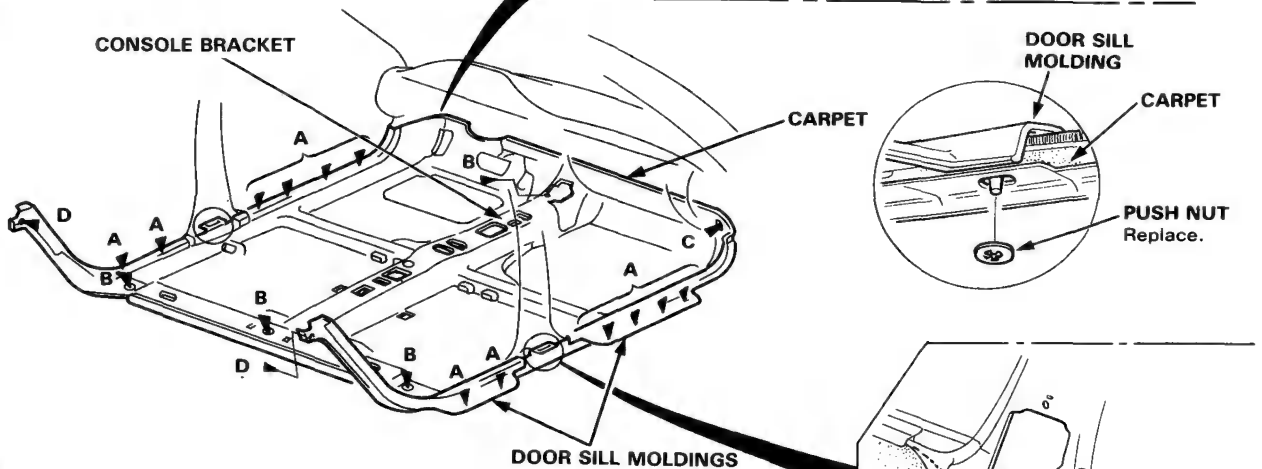
NOTE: When installing, slip the slits in the carpet over the console bracket.



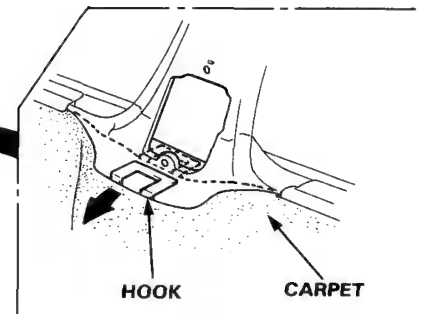
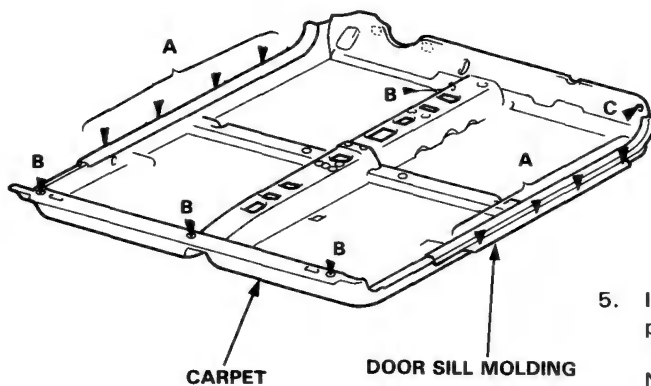
►: Clip locations



4D:



3D:



5. Install the carpet in the reverse order of the removal procedure.

NOTE:

- Take care not to damage, wrinkle or twist the carpet.
- Make sure the seat harnesses are routed correctly.

Center Console, Center Lower Cover

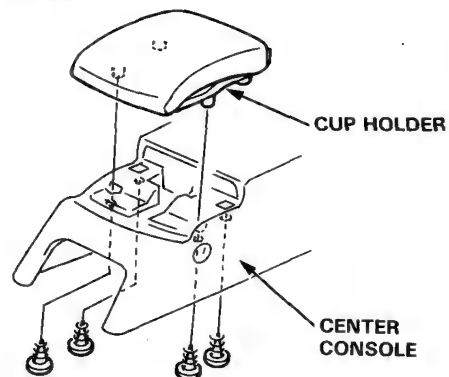
Replacement

Disassemble in numbered sequence.

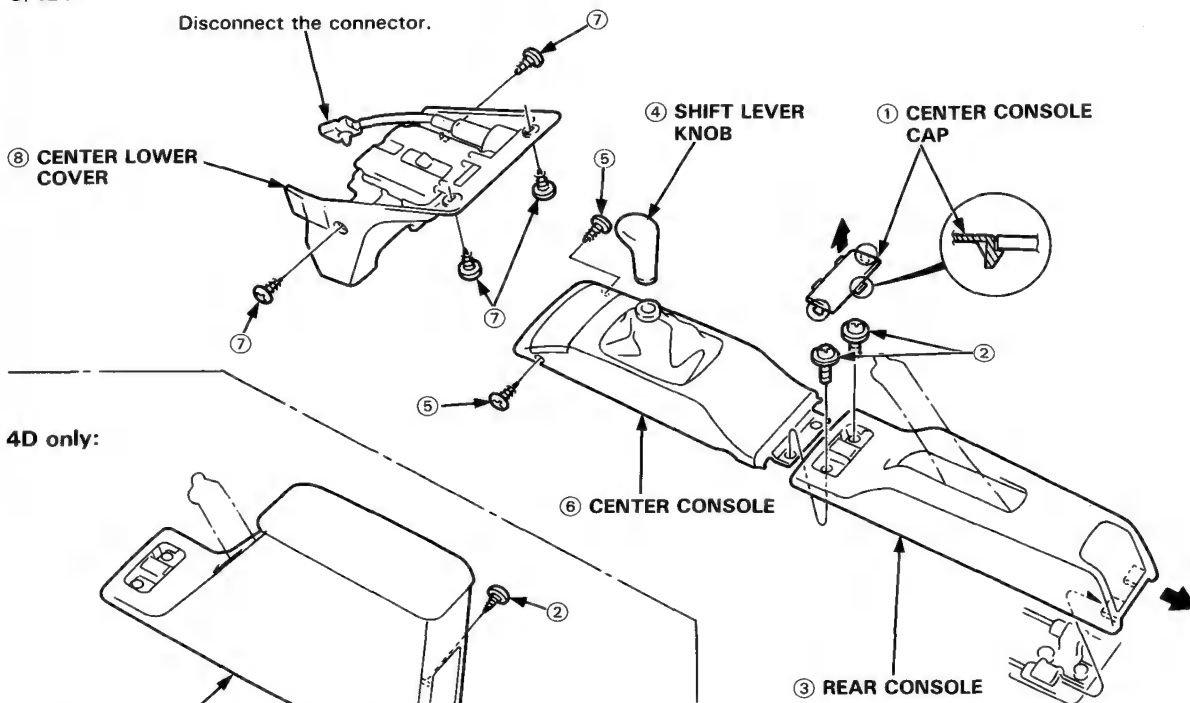
NOTE:

- Lift up the parking brake lever.
- Take care not to scratch the consoles and dashboard.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

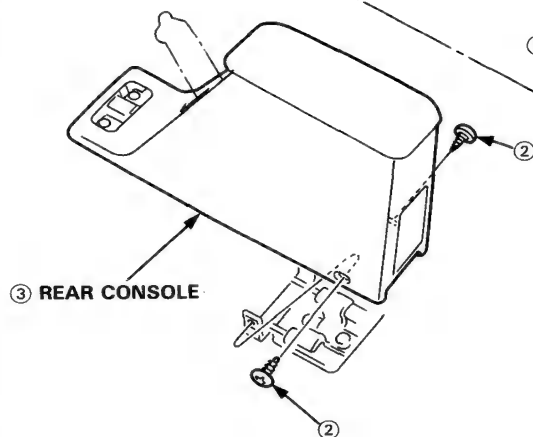
<Si, 1.2 EX>



3/4D:



4D only:



Installation is the reverse of the removal procedure.

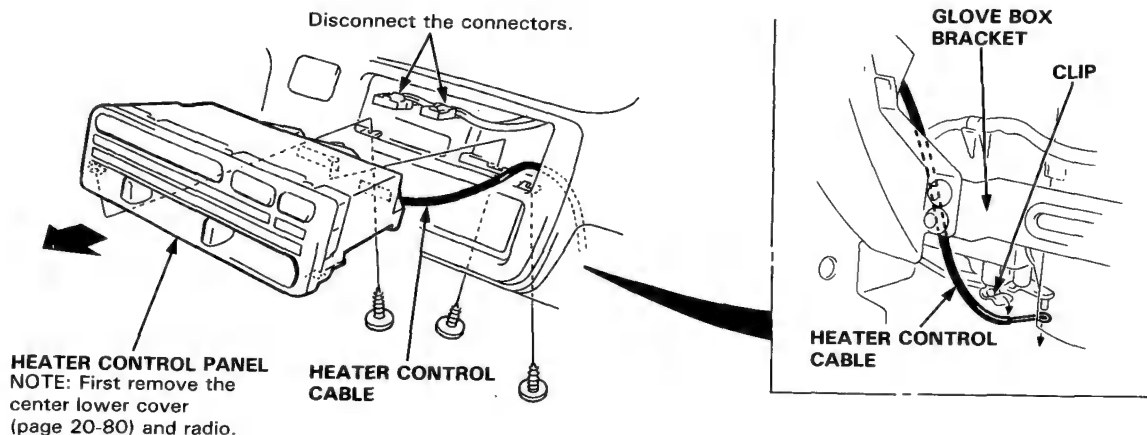
Dashboard



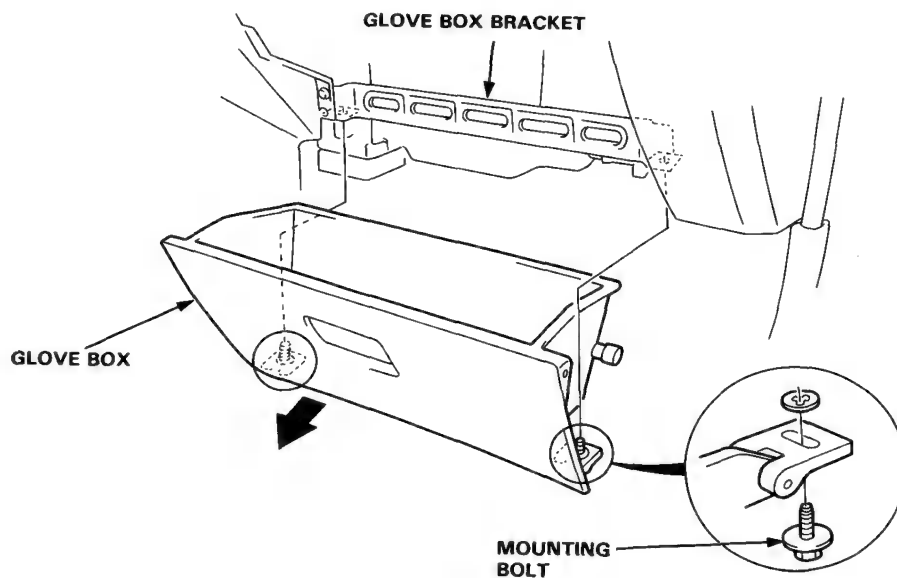
Component Removal/Installation

NOTE:

- Do not drop the screws inside the dashboard.
- Take care not to bend the cable.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.



Passenger's side:



(cont'd)

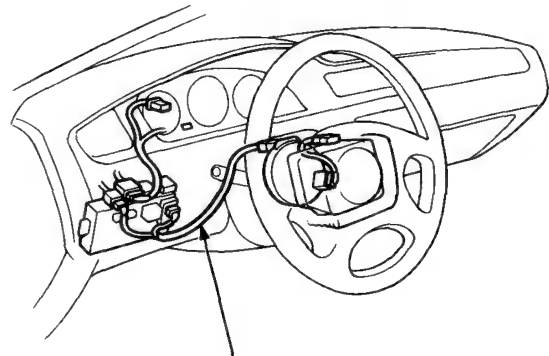
Dashboard

Component Removal/Installation (cont'd)

SRS wire harnesses are routed near the dashboard lower cover and steering column.

CAUTION: with SRS

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire effected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

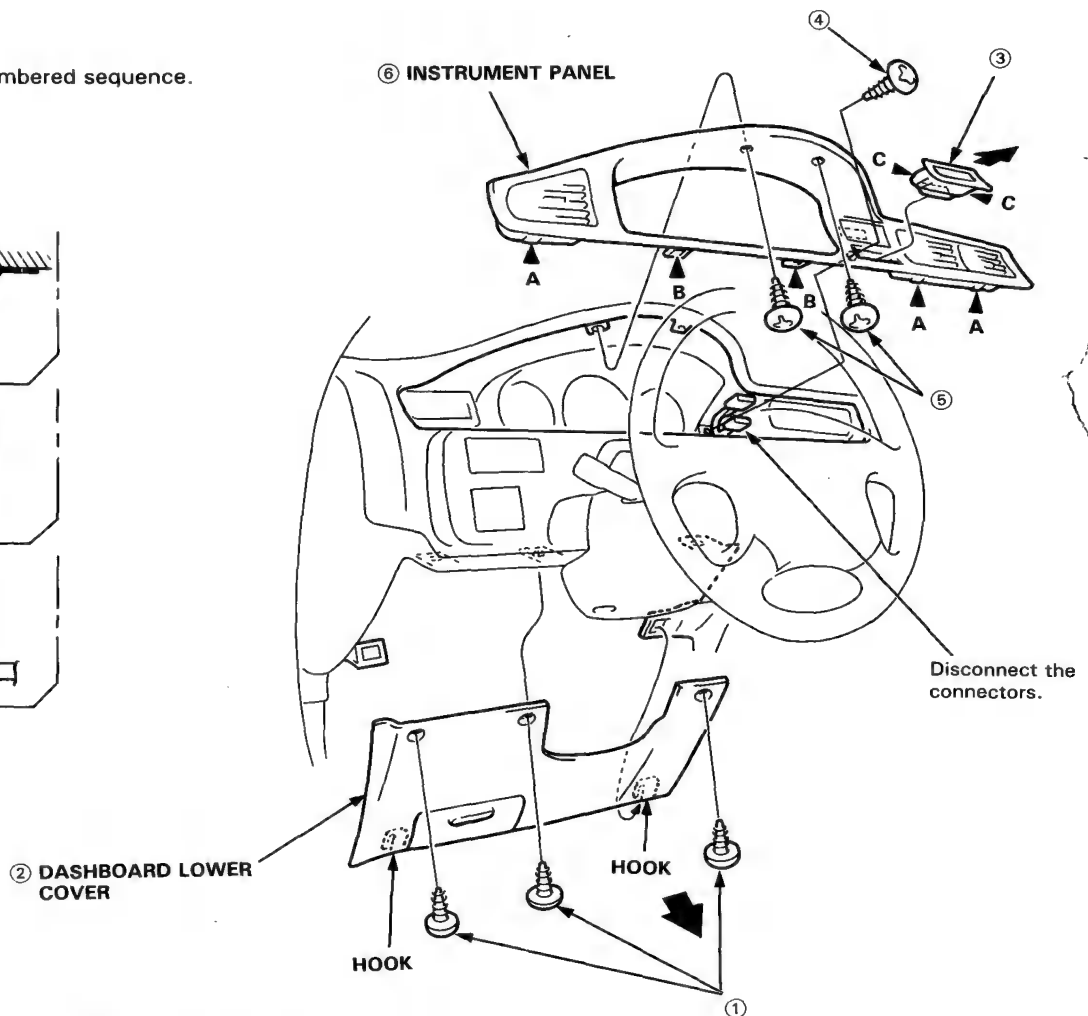
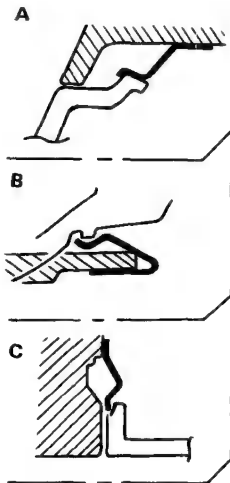


SRS MAIN HARNESS

Disassemble in numbered sequence.

Driver's side:

►: Clip locations



Installation is the reverse of the removal procedure.

NOTE: Take care not to scratch the dashboard.

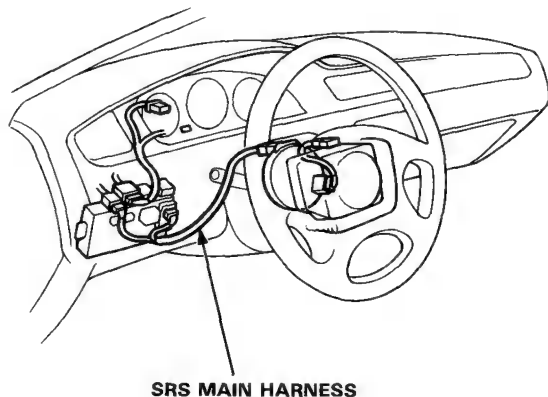


Replacement

SRS wire harnesses are routed near the dashboard and steering column.

CAUTION: with SRS

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire effected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

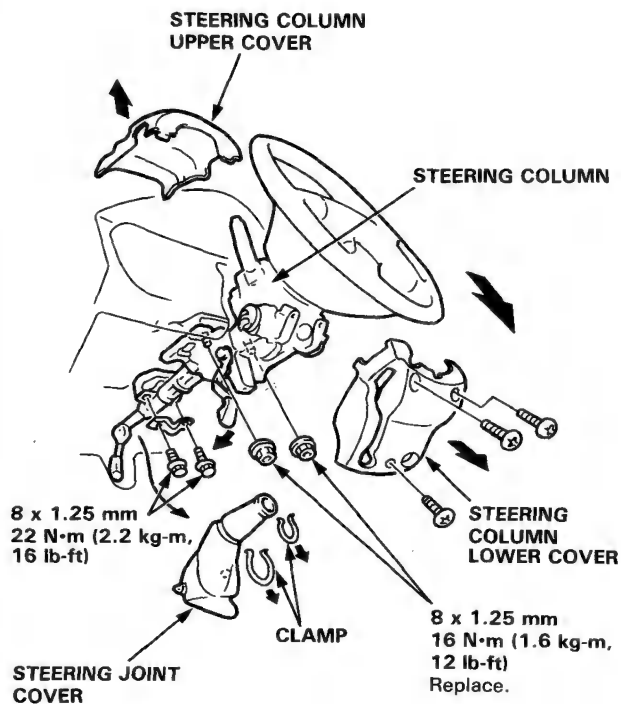


1. To remove the dashboard, first remove the:
 - Front seats (page 20-64)
 - Center lower cover (page 20-80)
 - Dashboard lower cover (page 20-82)
 - Glove box (page 20-81)

⚠ WARNING Before lowering the steering column, remove the steering column upper cover, then disconnect the connector between the slip ring and SRS main wire harness. Connect the short connector (RED) to the slip ring side of the connector (see Section 23).

2. Lower the steering column (see Section 17).

NOTE: To prevent damage to the steering column, wrap it with a shop towel.



3. Remove the access panel on each end and the upper air vent.
4. Disconnect the connectors and heater control cable.

(cont'd)

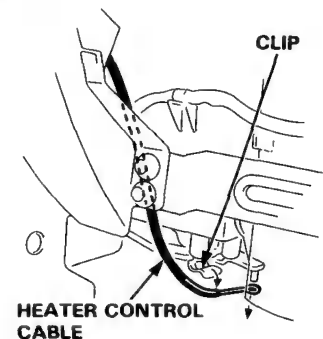
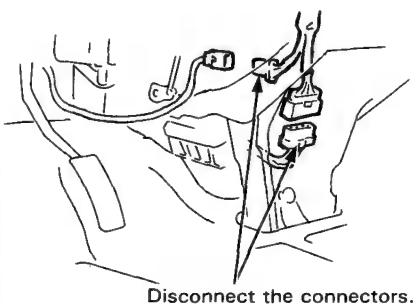
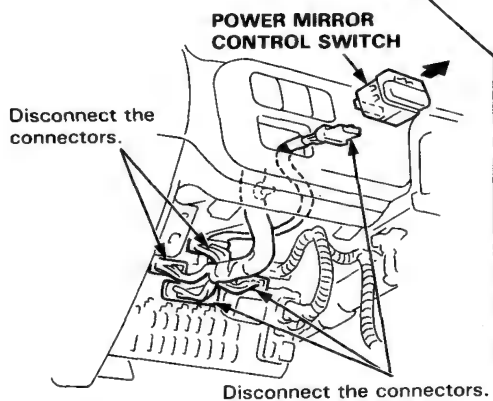
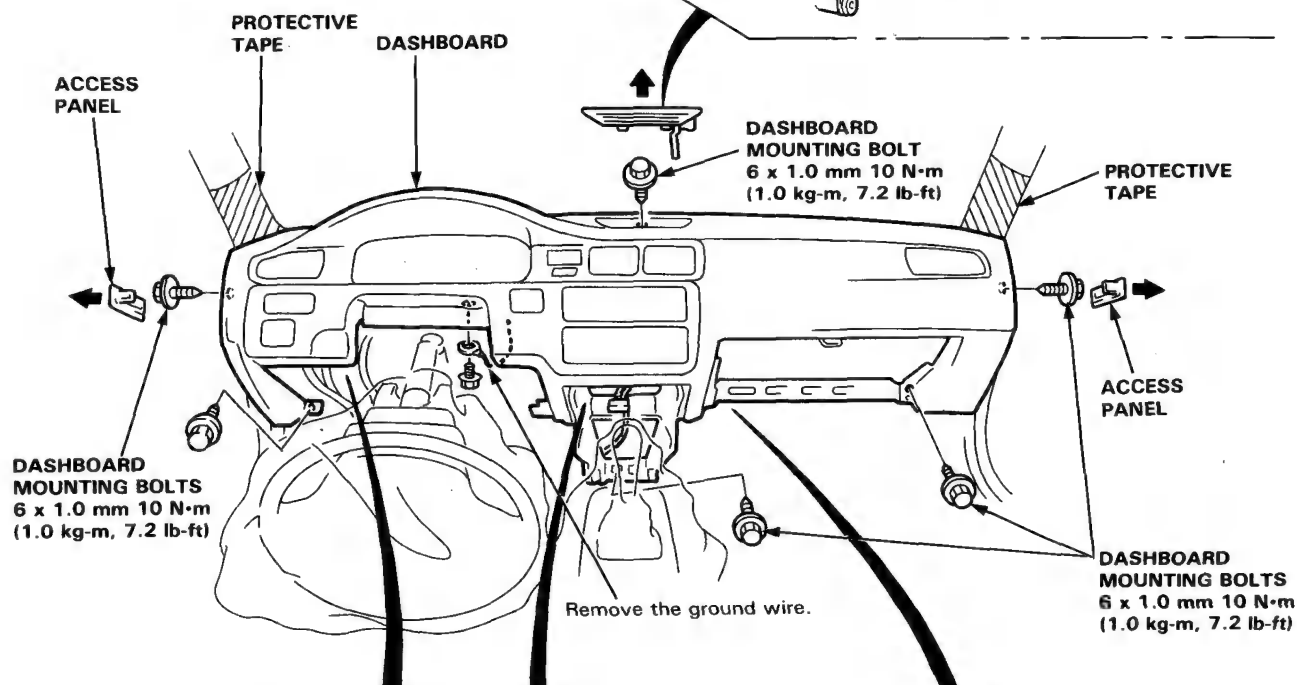
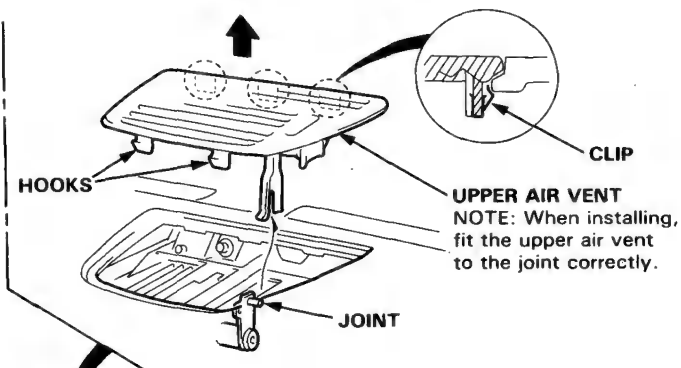
Dashboard

Replacement (cont'd)

5. Remove the 6 mounting bolts, then lift and remove the dashboard.

NOTE:

- Use protective tape on the bottom of the front pillar trim.
- Take care not to scratch the dashboard.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.



6. Installation is the reverse of the removal procedure.

NOTE: Before tightening the dashboard bolts, make sure the dashboard wires are not pinched, and that the dashboard is not interfering with the heater control cable.

Front Bumper

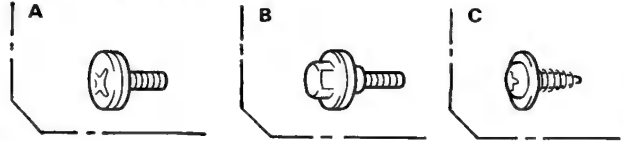


Replacement

NOTE:

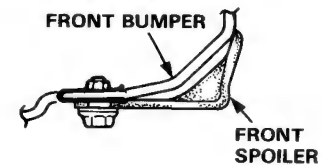
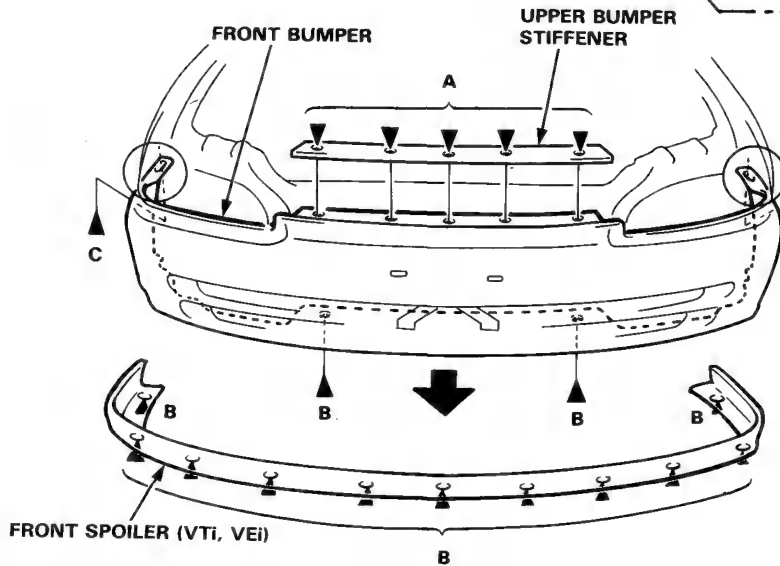
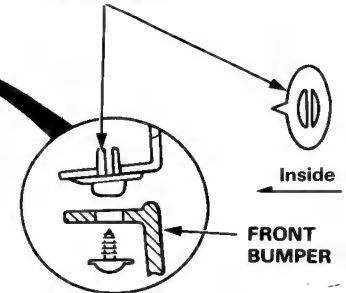
- An assistant is helpful when removing the front bumper and front bumper beam.
- Take care not to scratch the bumper.
- Open the hood.

► Bolt, screw locations



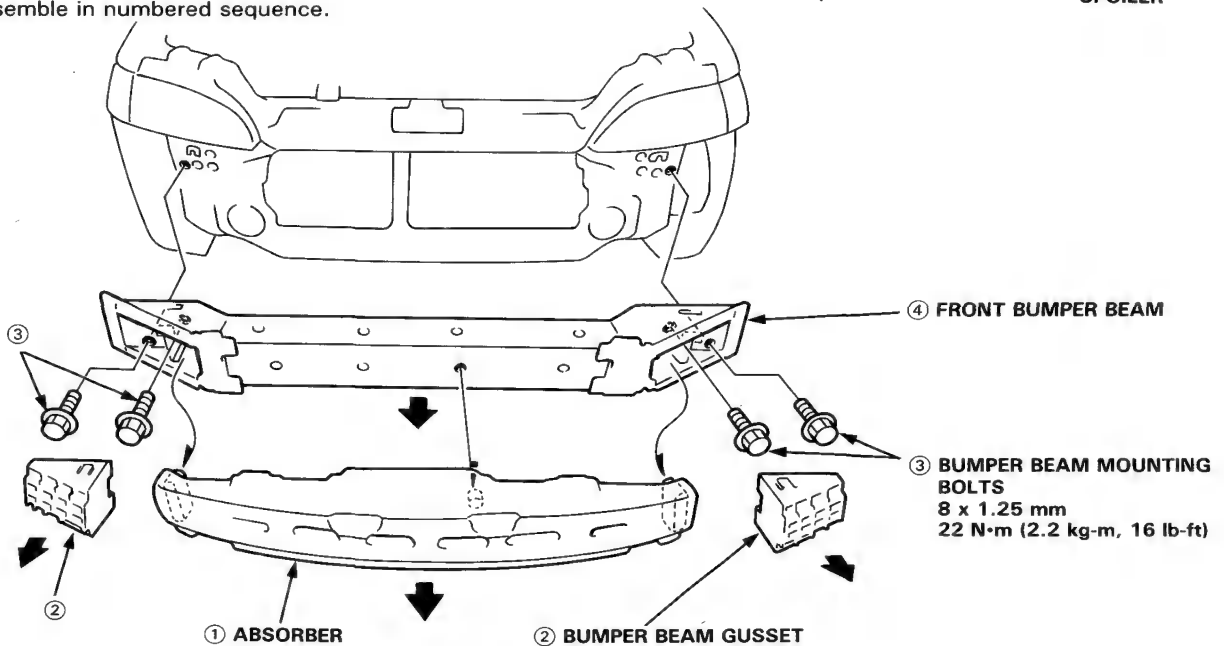
BUMPER SIDE GROMMET

NOTE: Install the grommet in the body as shown.



KY model:

Disassemble in numbered sequence.



Installation is the reverse of the removal procedure.

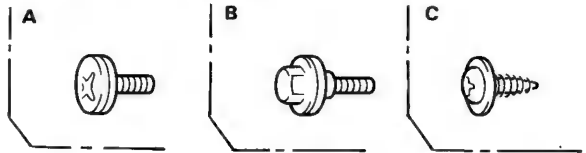
Rear Bumper

Replacement

NOTE:

- An assistant is helpful when removing the rear bumper and rear bumper beam.
- Take care not to scratch the bumper.
- Open the trunk lid.
- Disconnect the rear fog light connectors.

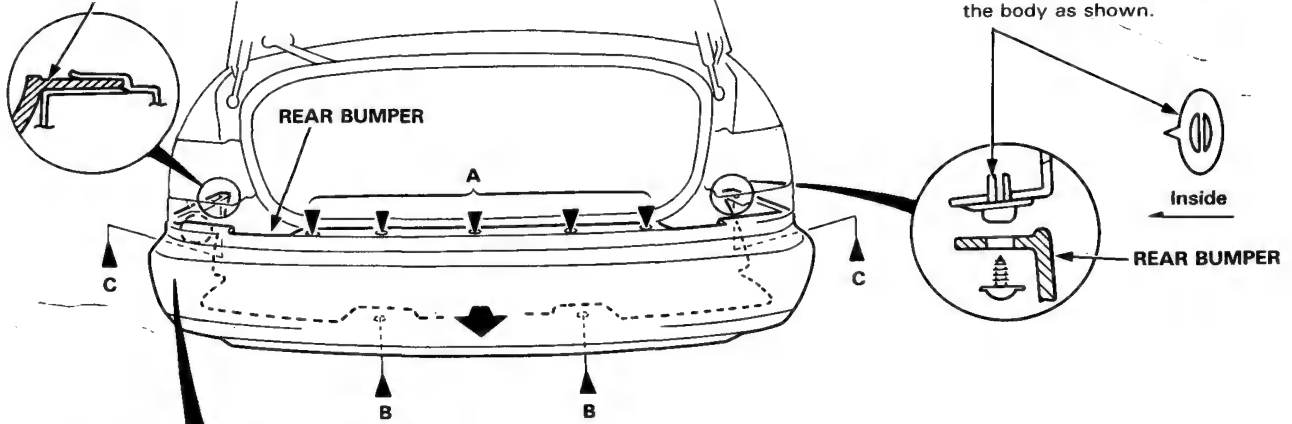
►: Bolt, screw locations



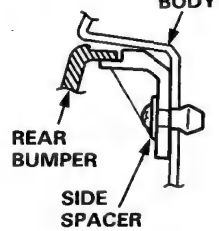
BUMPER SIDE GROMMET

NOTE: Install the grommet in the body as shown.

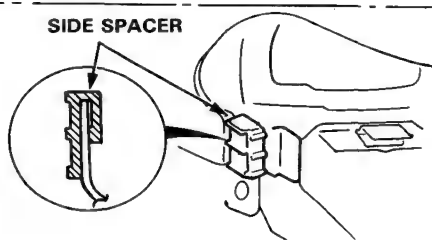
REAR BUMPER



4D:

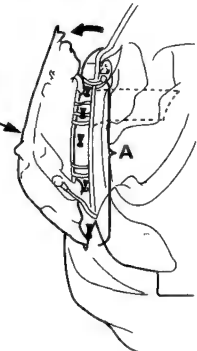


3D:



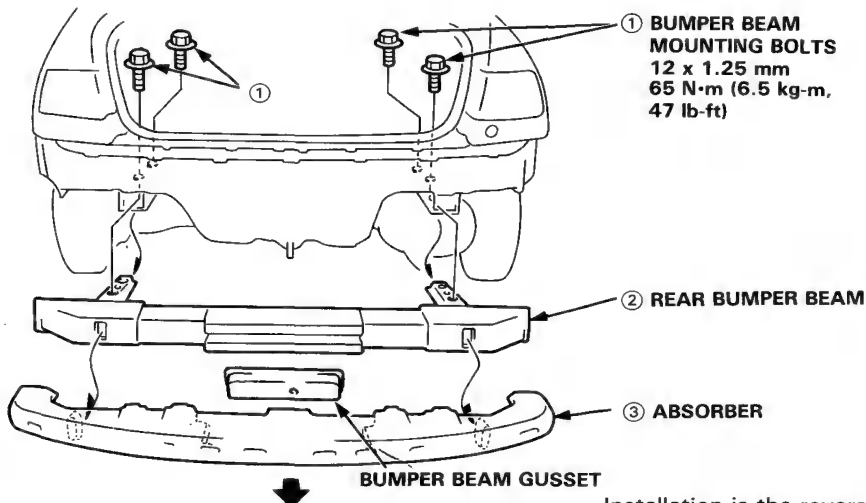
3D: To remove the upper bolts, open the tailgate until you can see the upper bolts, then hold it in that position.

LOWER GATE



KY model:

Disassemble in numbered sequence.



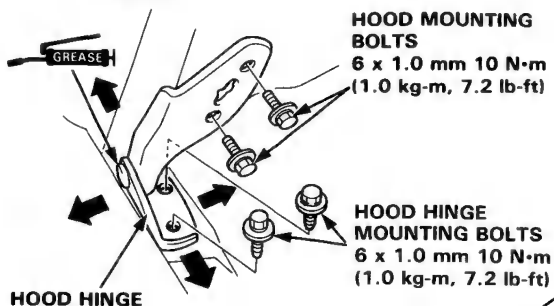
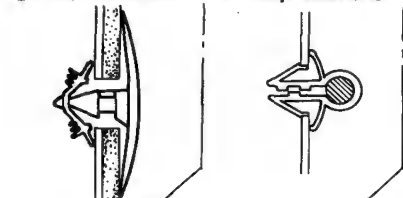
Installation is the reverse of the removal procedure.



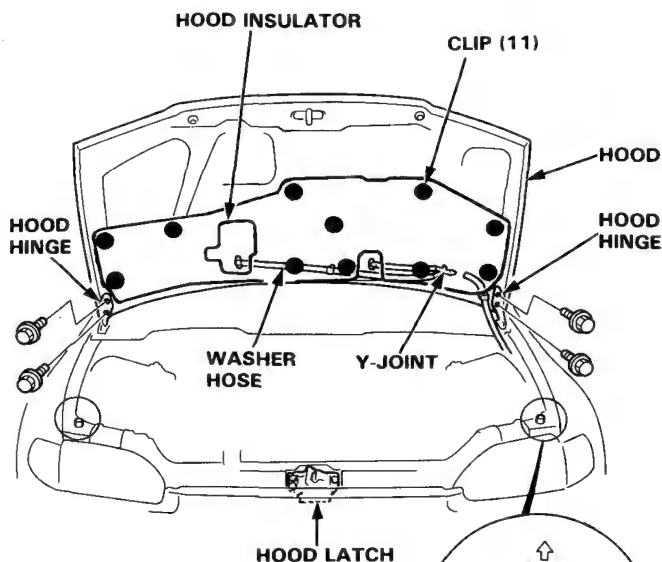
Hood/Opener and Latch

Replacement/Adjustment

●: Clip locations ▶: Clip locations

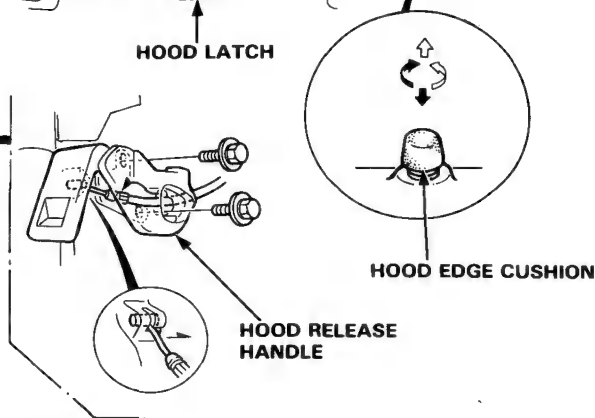
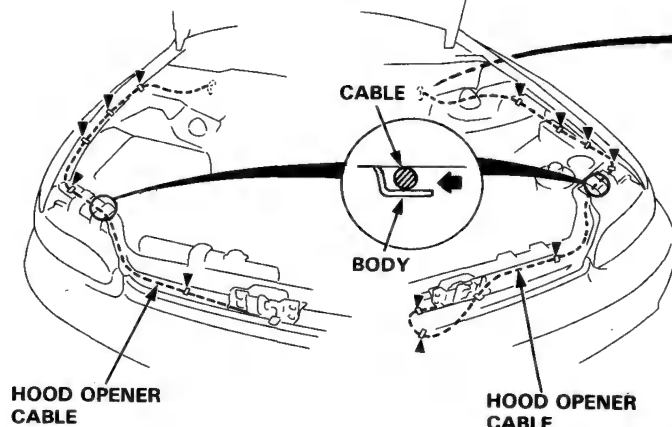


NOTE: An assistant is helpful when removing the hood.



RHD:

LHD:



ALIGNMENT:

- The hinges can be adjusted right and left as well as fore and aft by using the elongated holes.
- Turn the edge cushions as necessary, to make the hood fit flush with the body at front and side edges.
- Adjust the hood latch to obtain the proper height at the forward edge.

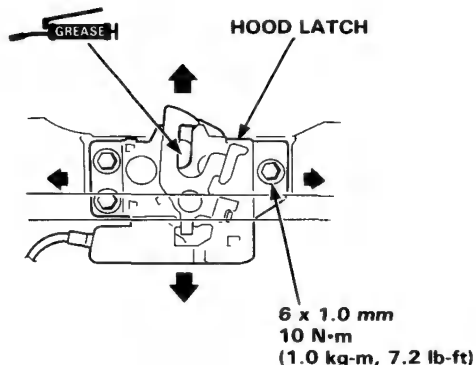
NOTE:

- Before pulling out the opener cable, tie a string to the cable so you can pull it back in later.
- Take care not to bend the opener cable.

Installation is the reverse of the removal procedure.

NOTE:

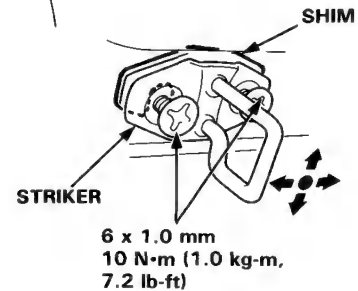
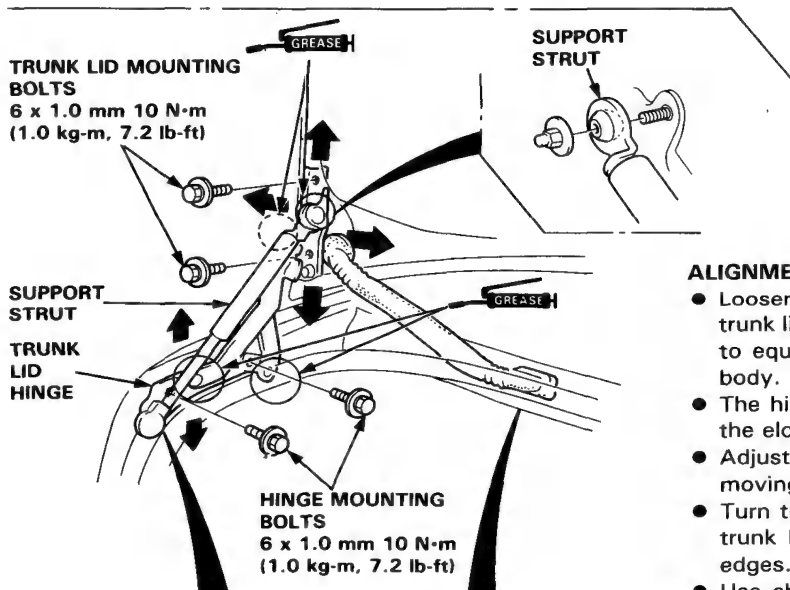
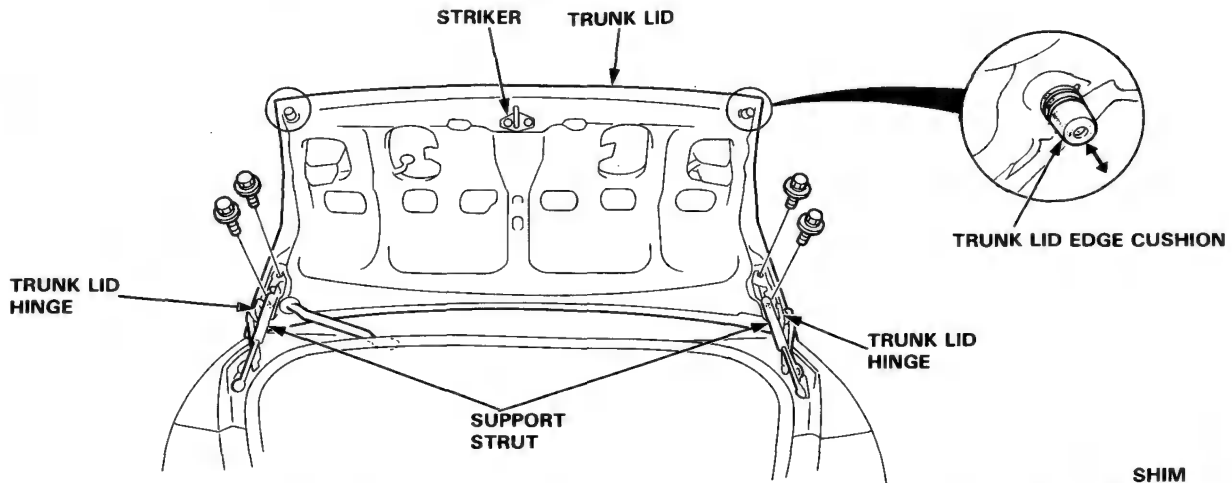
- Make sure the opener cable is routed and connected properly.
- Adjust the hood alignment.



Trunk Lid

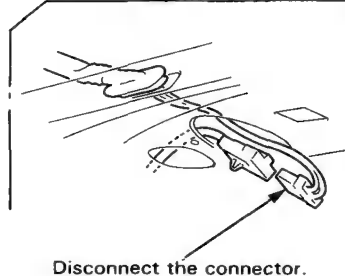
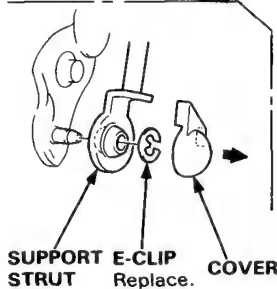
Replacement/Adjustment

NOTE: An assistant is helpful when removing the trunk lid.



ALIGNMENT:

- Loosen the trunk lid mounting bolts, then adjust the trunk lid fore and aft, and right and left as necessary to equalize the gap between the trunk lid and the body.
- The hinges can be adjusted up and down by using the elongated holes.
- Adjust the trunk lid fit to the trunk lid opening by moving the striker.
- Turn the edge cushions as necessary, to make the trunk lid fit flush with the body at front and side edges.
- Use shims as necessary, to make the trunk lid fit flush with the body at the rear edge.



Installation is the reverse of the removal procedure.

NOTE:

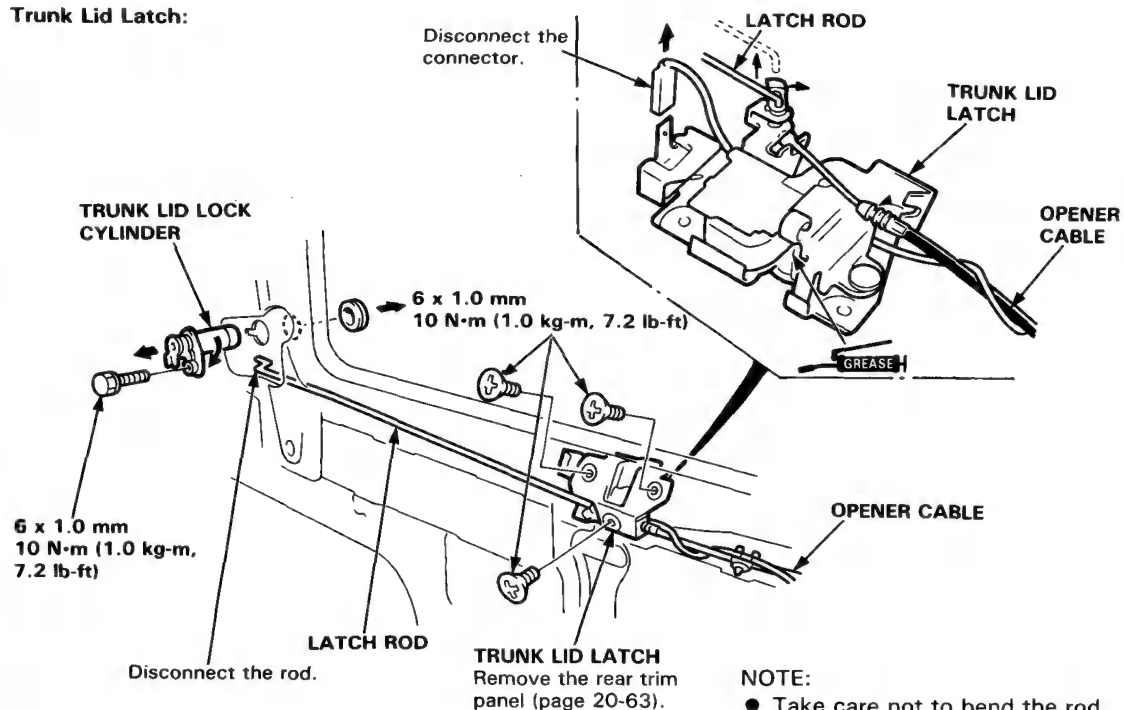
- Make sure the connector is connected properly.
- Adjust the trunk lid alignment.



Trunk Lid Latch/Opener Cables

Replacement

Trunk Lid Latch:

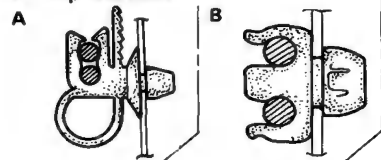


NOTE:

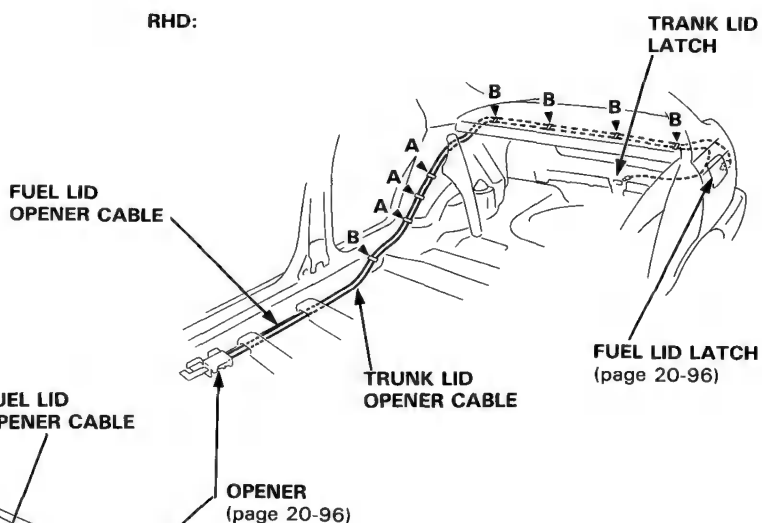
- Take care not to bend the rod.
- Adjust the trunk lid alignment with the striker (page 20-88).

Opener Cables:

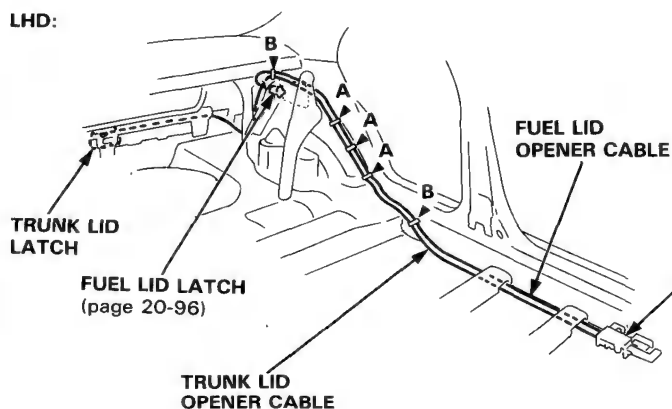
►: Clip locations



RHD:



LHD:



Installation is the reverse of the removal procedure.

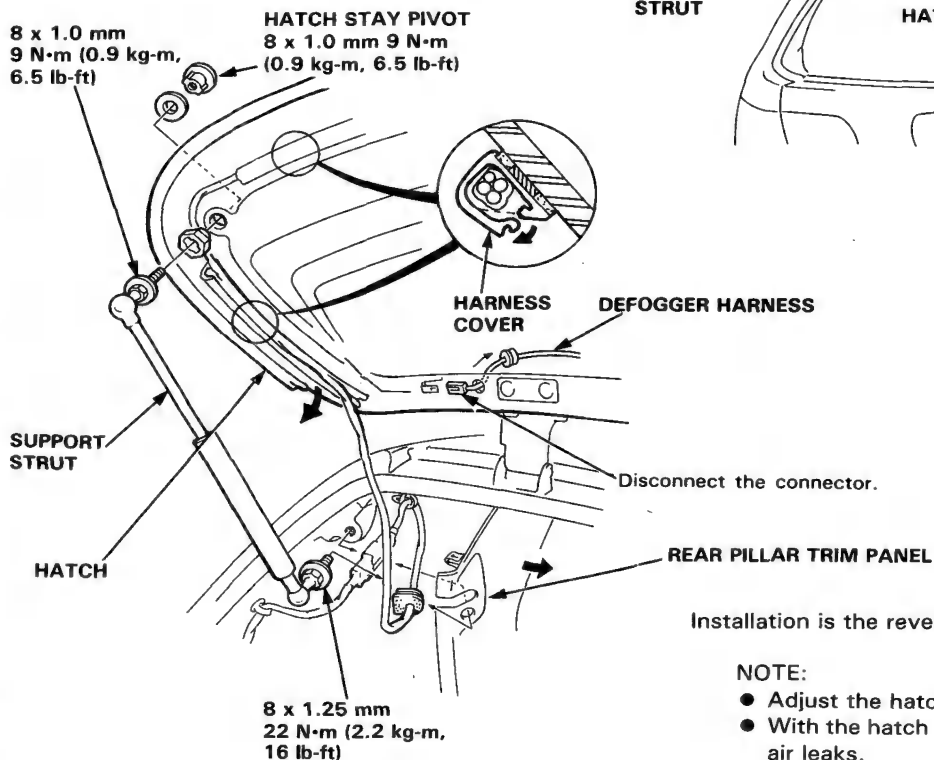
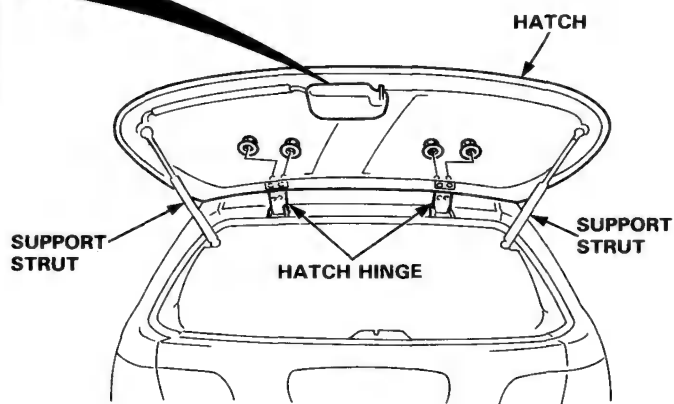
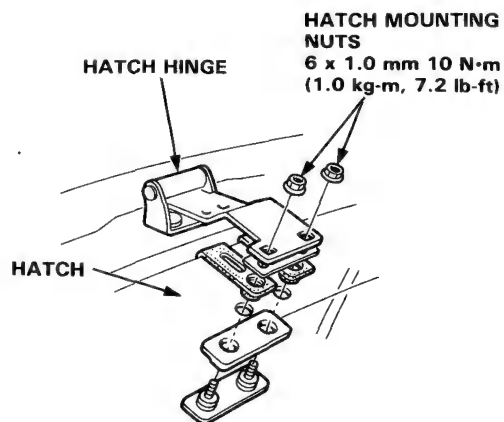
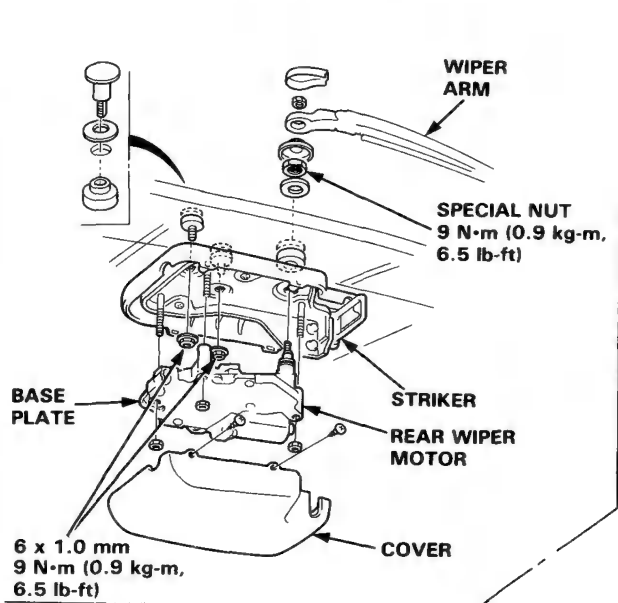
NOTE:

- Take care not to bend the cable.
- Make sure the trunk lid and fuel lid opener cables are routed and connected properly.

Rear Hatch Replacement

NOTE:

- An assistant is helpful when removing the hatch.
- Remove the hatch spoiler (page 20-97).
- Take care not to damage the hatch.



Installation is the reverse of the removal procedure.

NOTE:

- Adjust the hatch alignment.
- With the hatch closed fully, check for water and air leaks.



Adjustment

NOTE:

- Check that the tailgate fits flush with the body.
- Take care not to damage the hatch.

1. Carefully close the hatch, then loosen the hatch mounting bolts.

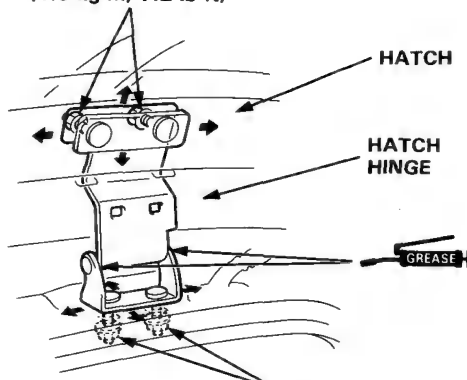
NOTE: Do not install the support struts.

2. Adjust the hatch for a flush fit with the body, then equalize the gap between the right, left, and bottom edges and the body. Lightly tighten the nuts and recheck.

NOTE: Loosen the striker mounting screws slightly.

HATCH MOUNTING NUTS

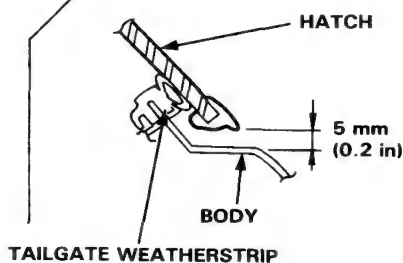
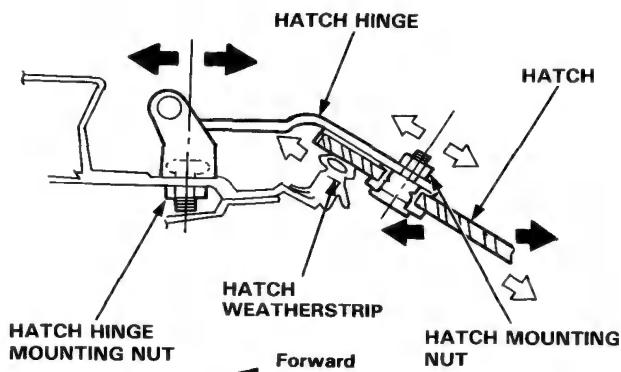
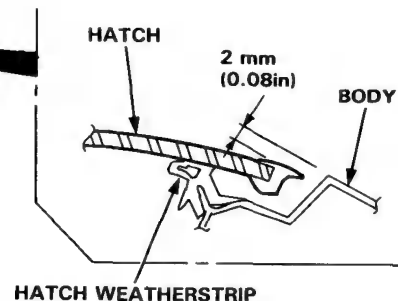
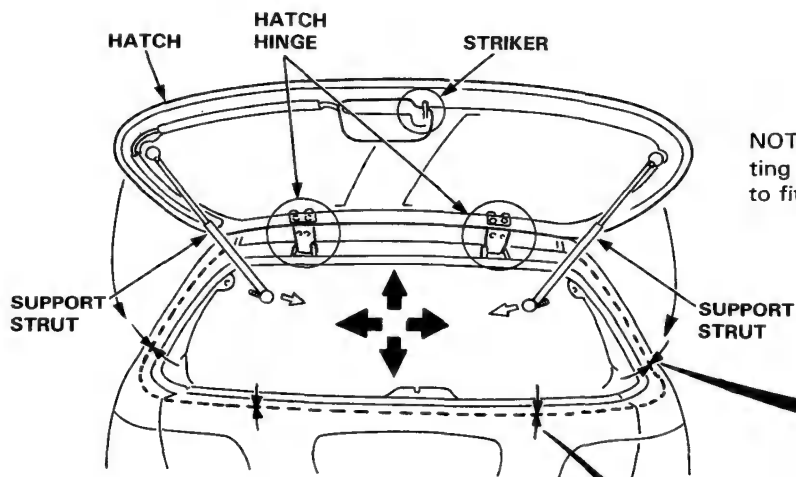
6 x 1.0 mm 10 N·m
(1.0 kg-m, 7.2 lb-ft)



HATCH HINGE MOUNTING NUTS

6 x 1.0 mm 10 N·m
(1.0 kg-m, 7.2 lb-ft)

NOTE: If necessary, loosen the hatch hinge mounting nuts and move the hatch backward or forward to fit the weatherstrip.



(cont'd)

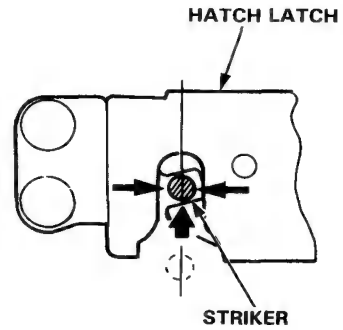
Rear Hatch

Adjustment (cont'd)

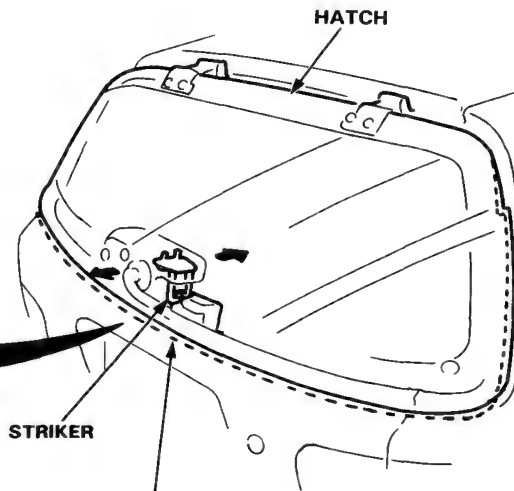
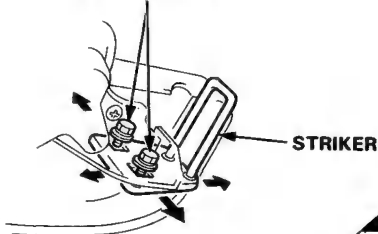
3. Tighten the hatch mounting nuts and install the support struts.
Adjust the striker alignment.

NOTE:

- Move the striker up or down to make the hatch fit flush with the tailgate.
- Move the striker right or left until it's centered in the hatch latch as shown.



STRIKER MOUNTING BOLTS
6 x 1.0 mm 10 N·m
(1.0 kg-m, 7.2 lb-ft)



NOTE: When equalizing the gap between the hatch and tailgate, do not deform the hatch.

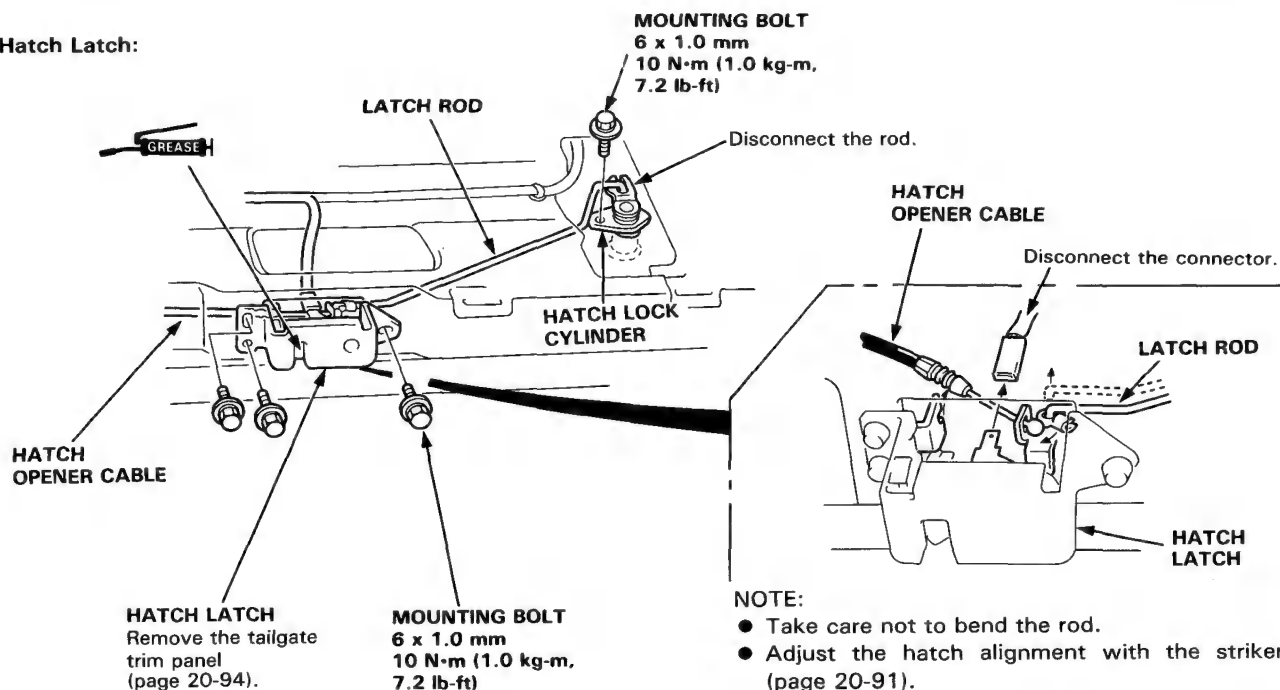
4. Tighten the striker mounting bolts.
5. With the hatch closed fully, check for water and air leaks.



Rear Hatch Latch/Opener Cables

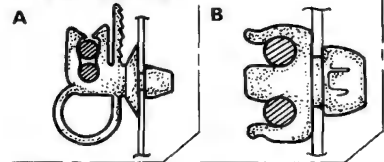
Replacement

Hatch Latch:

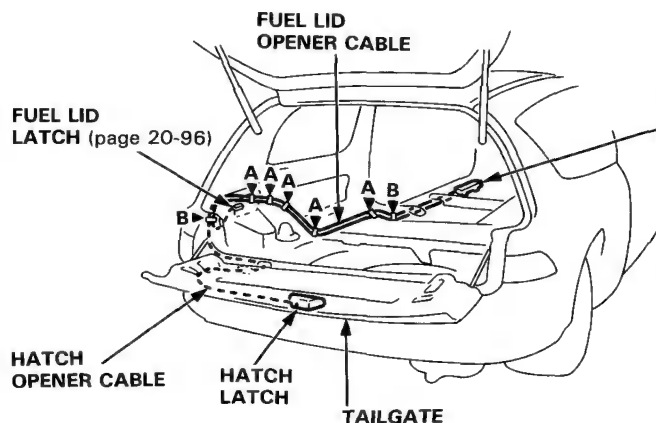


Opener Cables:

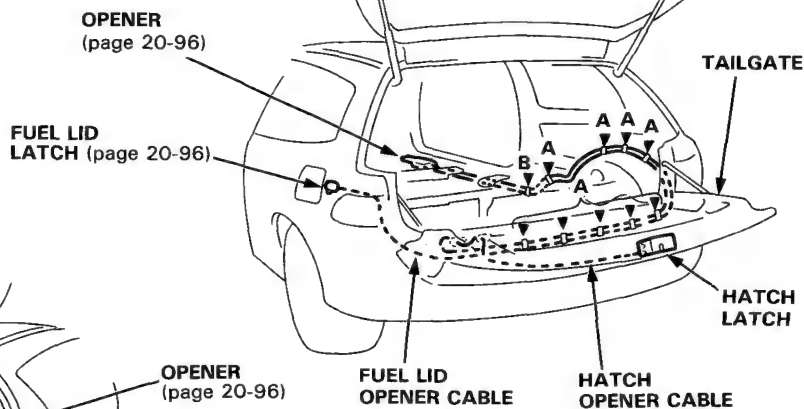
►: Clip locations



LHD:



RHD:



Installation is the reverse of the removal procedure.

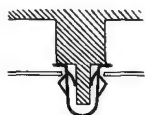
NOTE:

- Take care not to bend the cable.
- Make sure the hatch and fuel lid opener cables are routed and connected properly.

Tailgate

Replacement/Adjustment

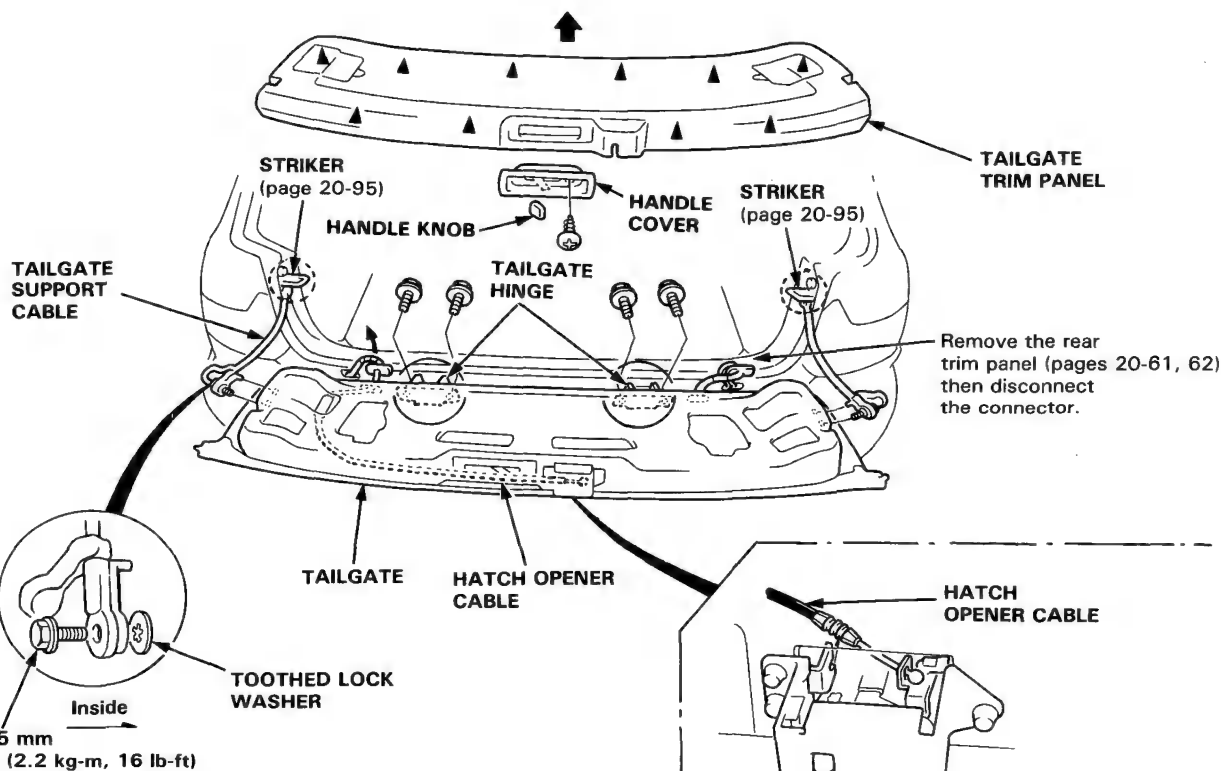
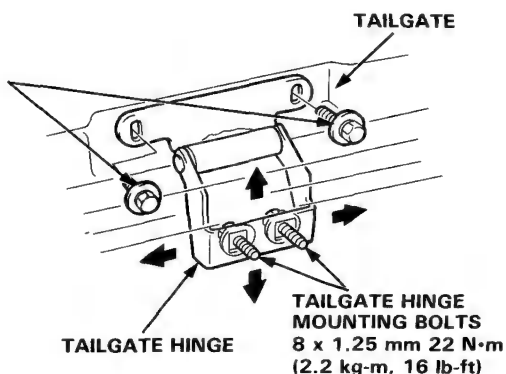
►: Clip locations



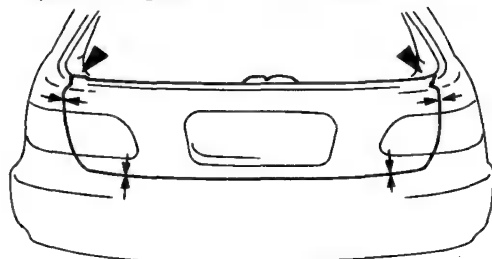
ALIGNMENT:

- Adjust the hinges fore and aft, and right and left as necessary to equalize the gap between the tailgate and body.
- Adjust the tailgate fit in the opening by moving the striker (page 20-95).

TAILGATE MOUNTING BOLTS
6 x 1.0 mm 10 N·m
(1.0 kg-m, 7.2 lb-ft)



Equalize the gap between the tailgate and body.



Installation is the reverse of the removal procedure.

NOTE:

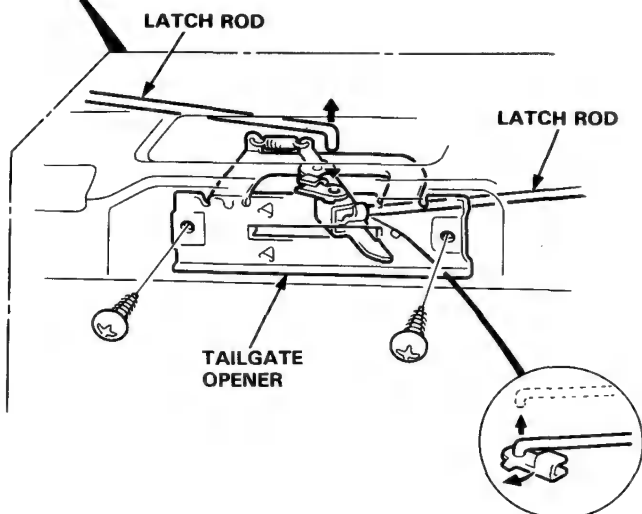
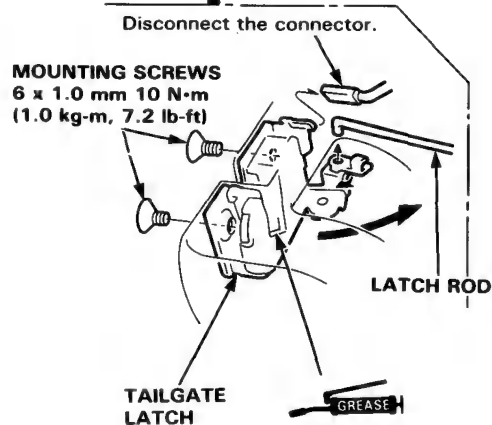
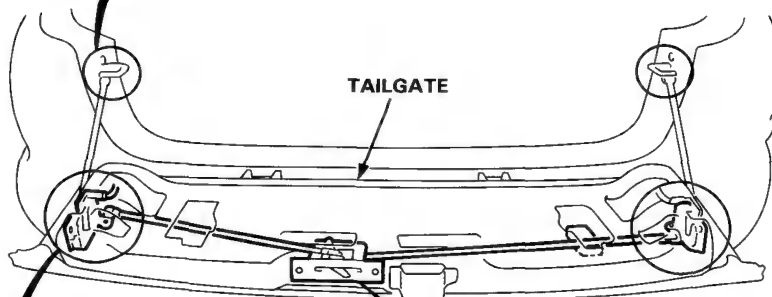
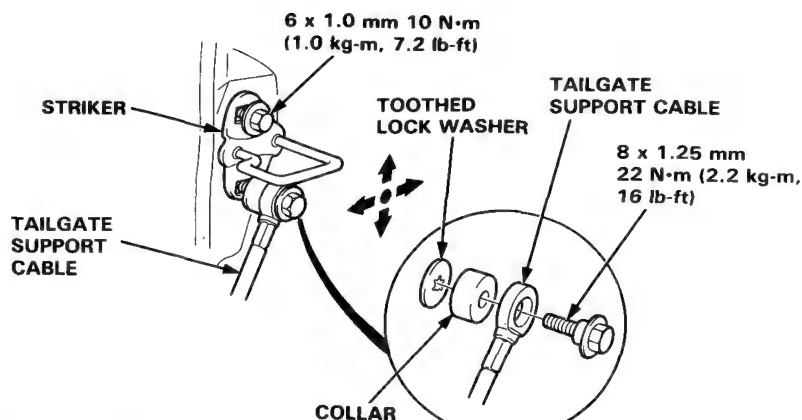
- Take care not to bend the opener cable.
- Make sure the opener cable is routed properly.
- Adjust the tailgate alignment.



Tailgate Opener and Latch

Replacement

NOTE: Remove the tailgate trim panel (pages 20-61, 62).



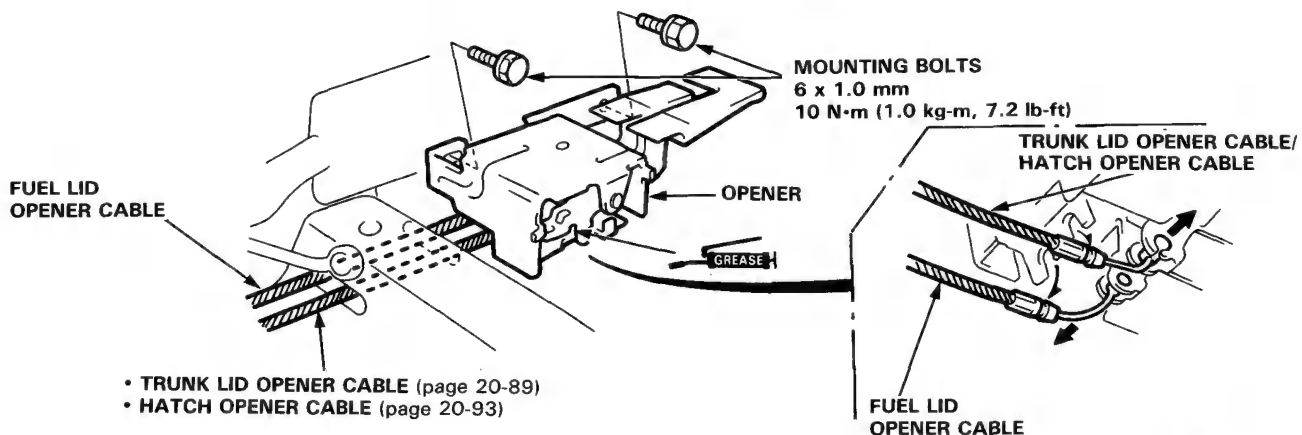
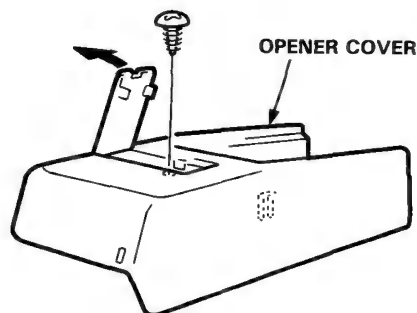
Installation is the reverse of the removal procedure.

NOTE:

- Take care not to bend the rod.
- Adjust the tailgate alignment with the striker.

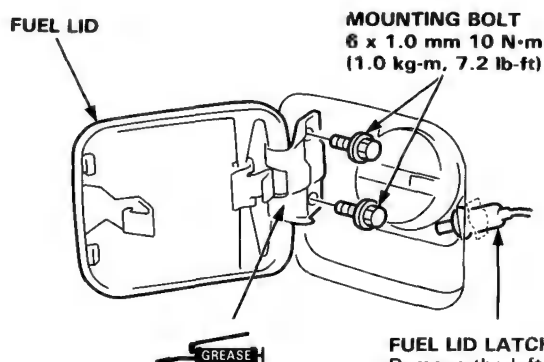
Opener and Fuel Lid Latch Replacement

Opener:



NOTE: Make sure the opener cables are connected properly.

Fuel Lid Latch:



FUEL LID LATCH

Remove the left quarter trim panel (3D pages 20-61, 62) left trunk side panel (4D page 20-63) and fuel lid latch by turning it 90°.

Installation is the reverse of the removal procedure.

NOTE:

- Take care not to bend the cable.
- Make sure the fuel lid fits flush with the body.

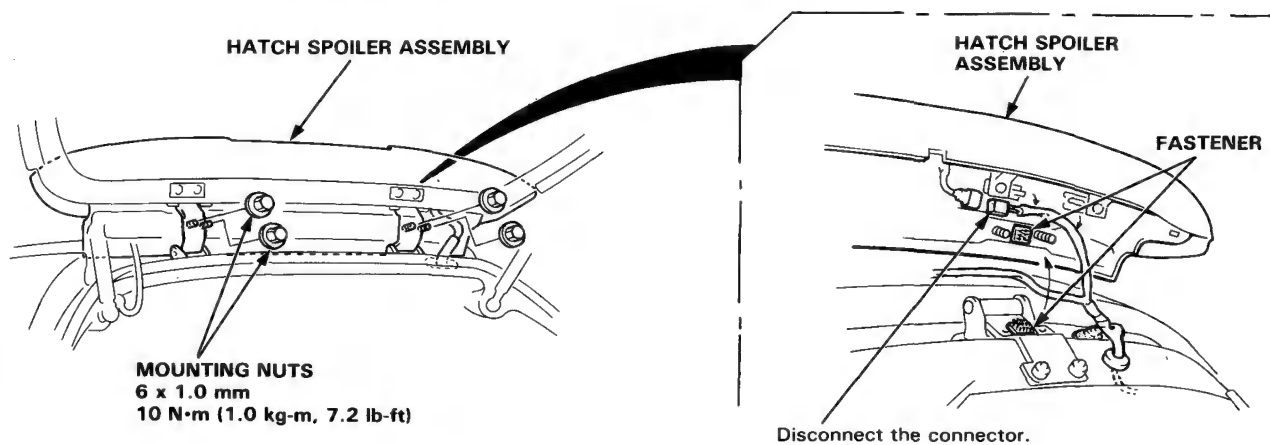
Hatch Spoiler



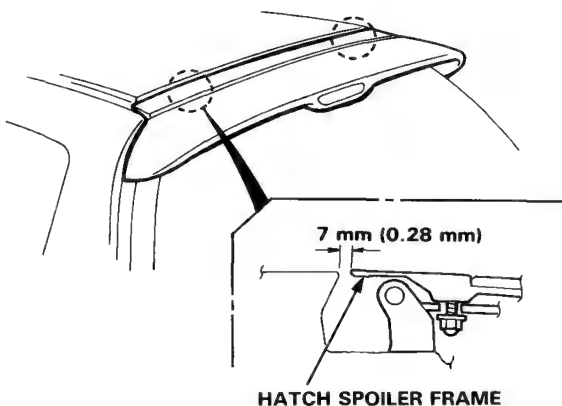
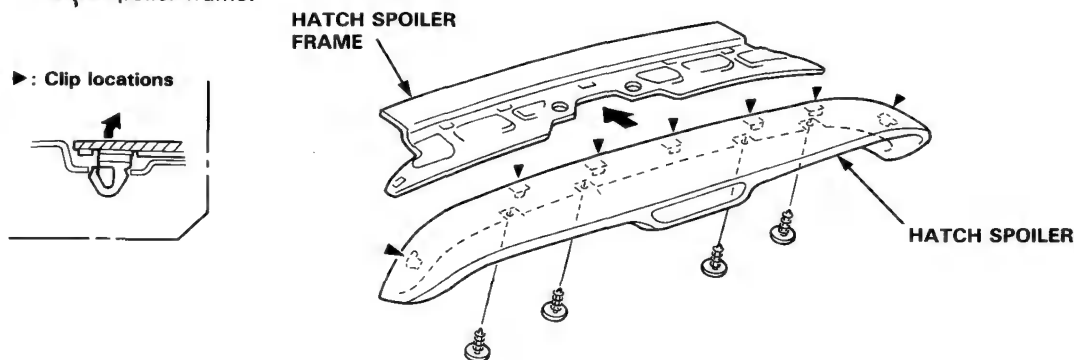
Replacement

NOTE:

- Open the hatch.
- Take care not to damage the hatch and body.



- If necessary, remove the hatch spoiler from the hatch spoiler frame.



Installation is the reverse of the removal procedure.

NOTE:

- Adjust the hatch spoiler assembly to align with the body as shown.
- Take care not to pinch the washer hose and harnesses.

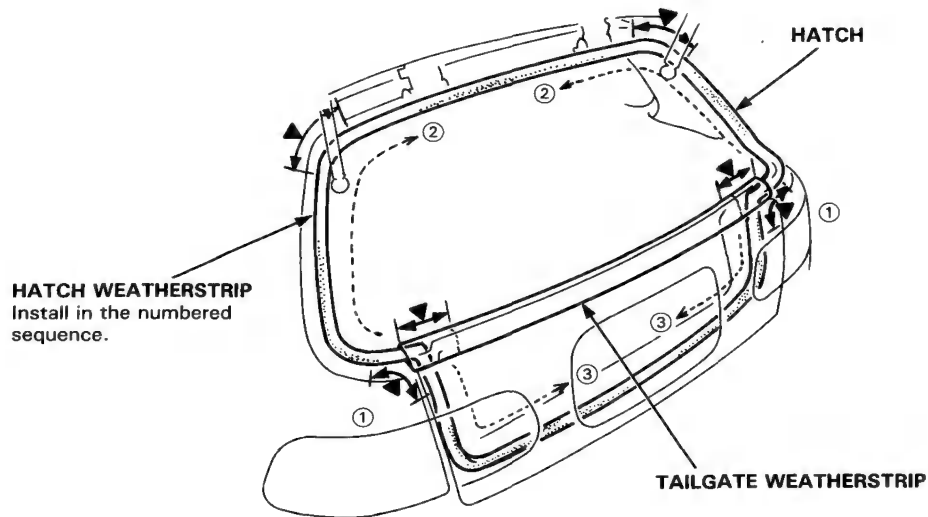
Rear Opening Weatherstrip/Trim/Corner Skirt

Replacement

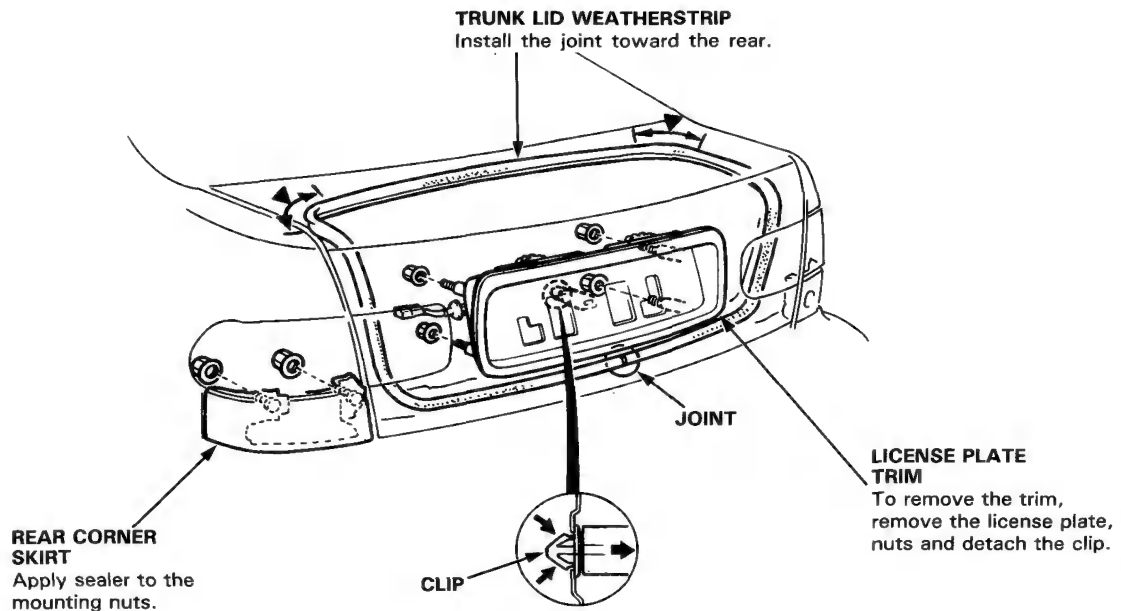
NOTE:

- Before installing the weatherstrips, apply clear sealant.
- Hatch weatherstrip: To the body at the ► locations.
- Tailgate weatherstrip: Into the weatherstrip at the ► locations.
- After applying the sealant, glue the weatherstrips.
- Tailgate or trunk lid closed, check for water leaks.

3D:



4D:



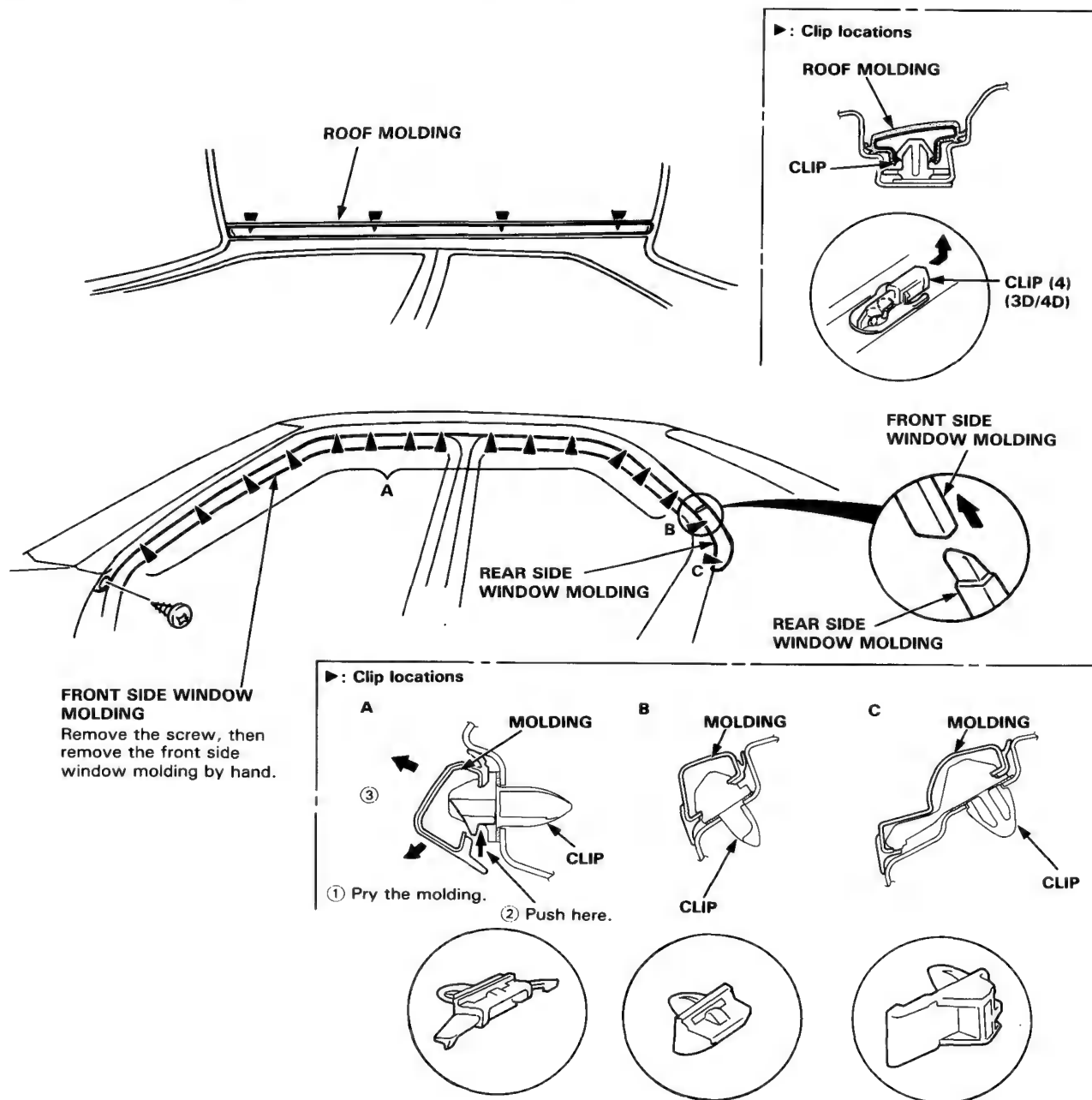
Roof Molding/Side Window Moldings



Replacement

NOTE:

- Take care not to bend the moldings and body.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

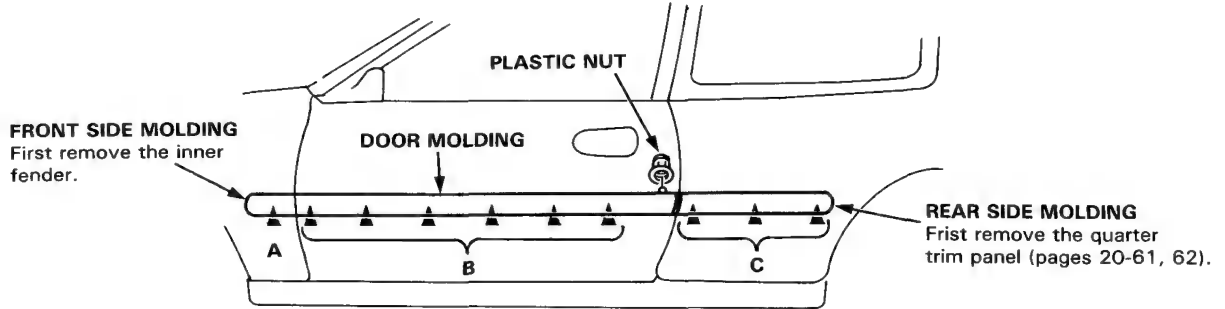
Door Moldings

Replacement

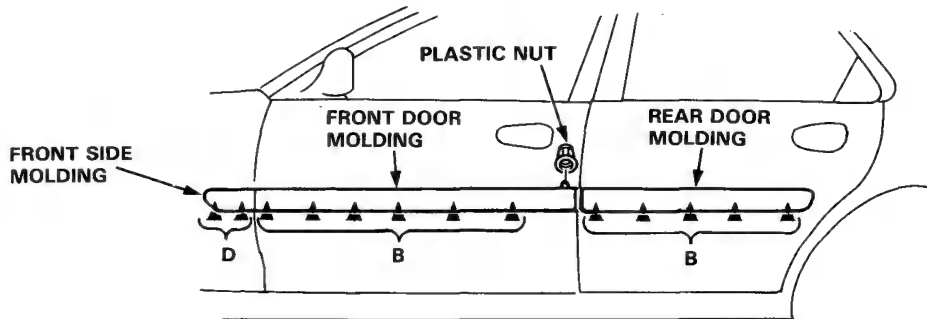
NOTE:

- To remove the door molding, remove the door panel and plastic cover (pages 20-4, 5, 13, 14).
- Take care not to bend the moldings.

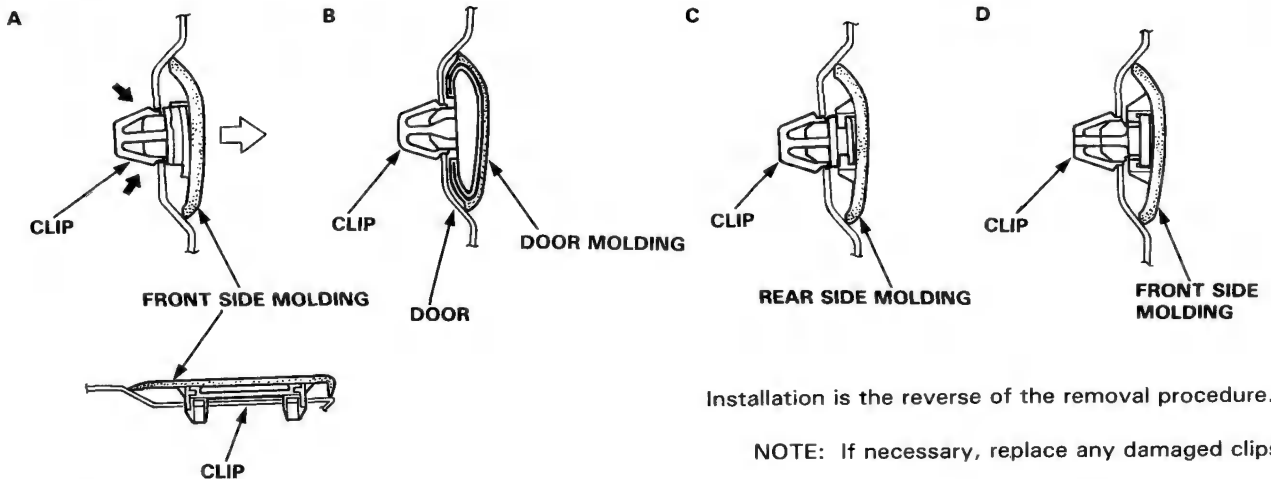
3D:



4D:



►: Clip locations

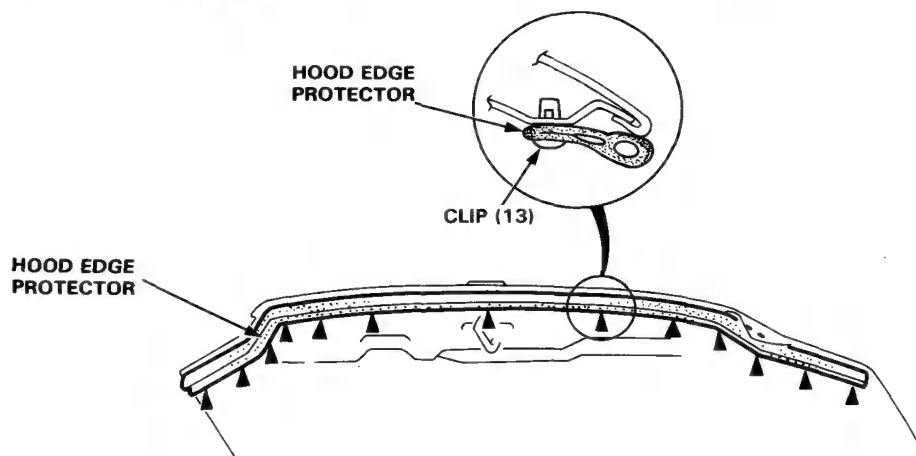




Hood Edge Protector/Side Sill Panel

Hood Edge Protector Replacement

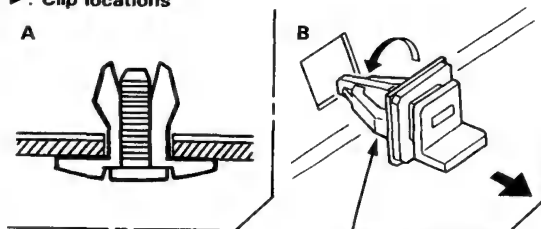
►: Clip locations



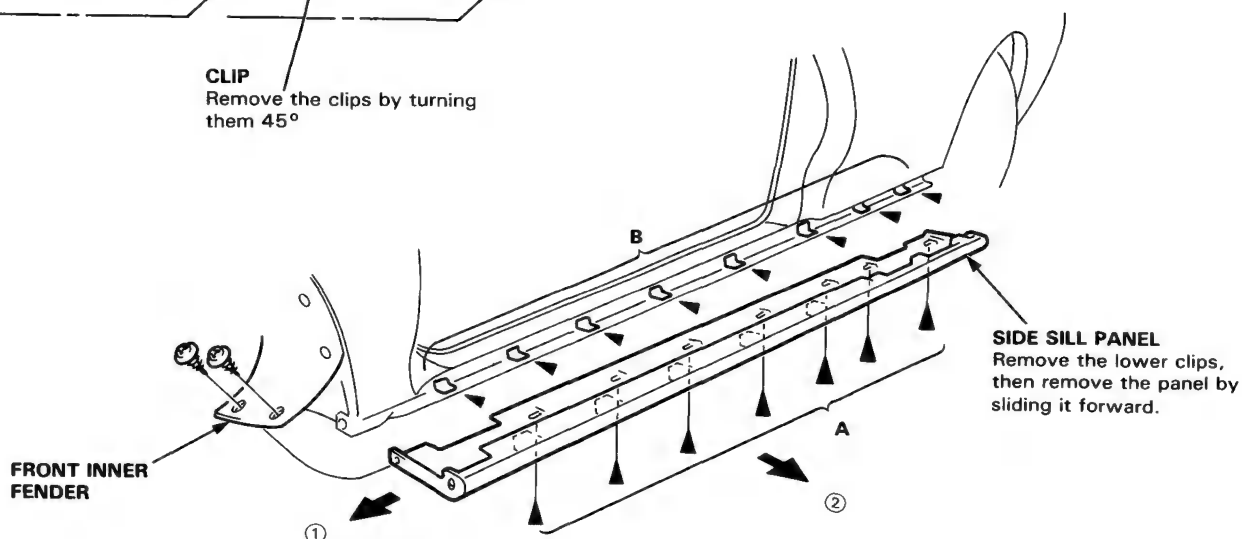
NOTE: If necessary, replace any damaged clips.

Side Sill Panel Replacement

►: Clip locations



CLIP
Remove the clips by turning them 45°



Installation is the reverse of the removal procedure.

NOTE:

- Take care not to twist the side sill panel.
- If necessary, replace any damaged clips.
- When installing, set the side sill panel on the clips.

Rear Emblems

Installation

Apply the emblems where shown.

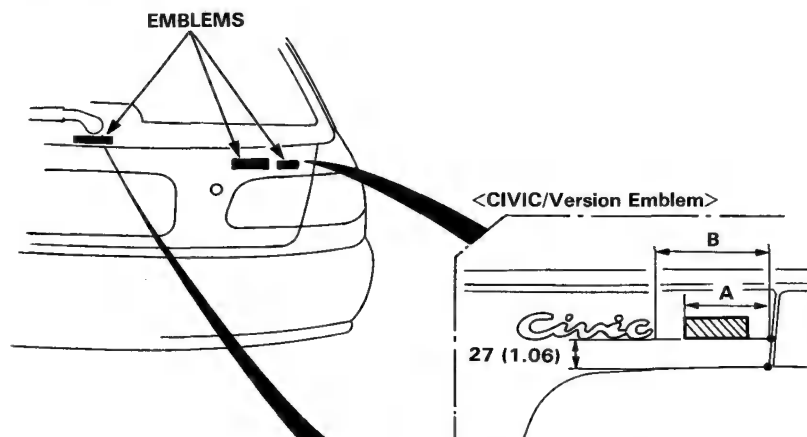
NOTE:

- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease or water from getting on the surface.
- When applying, make sure there are no wrinkles in the emblems.

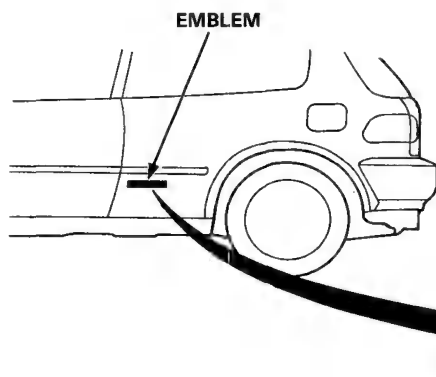
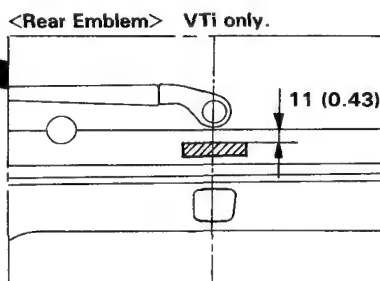
Attachment Points:

3D:

Unit: mm (in)



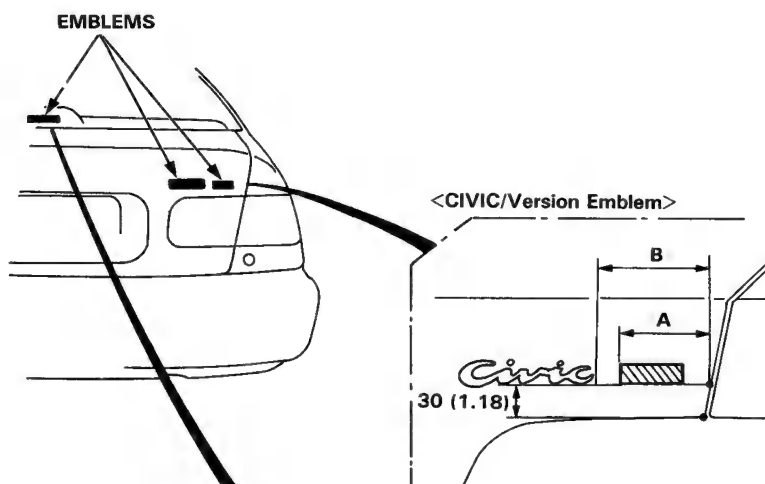
Emblem	A	B
DX	94.0 (3.70)	105.0 (4.13)
Si	67.5 (2.66)	78.5 (3.09)
VEi	88.5 (3.48)	105.5 (4.15)
DXi	107.0 (4.21)	118.0 (4.65)
LSi	94.0 (3.70)	105.0 (4.13)
ESi	95.0 (3.74)	106.0 (4.17)
VTi	88.5 (3.48)	105.5 (4.15)
GL	84.5 (3.33)	95.5 (3.76)
EX	90.0 (3.54)	101.0 (3.98)
EL	84.5 (3.33)	95.5 (3.76)



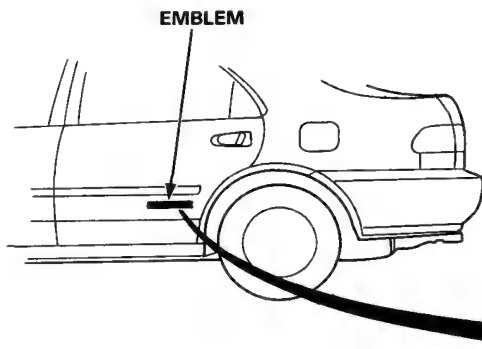
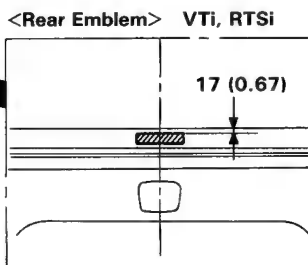


4D:

Unit: mm (in)



Emblem	A	B
EX	88.0 (3.46)	99.0 (3.90)
DXi	104.5 (4.11)	115.5 (4.55)
LSi	92.0 (3.62)	103.0 (4.10)
ESi	93.0 (3.66)	104.0 (4.09)
VTi	86.0 (3.39)	103.0 (4.10)
GL	81.5 (3.21)	92.5 (3.64)
Si	65.0 (2.60)	76.0 (3.00)
EL	81.0 (3.20)	92.0 (3.62)
RTSi	116.5 (4.60)	127.5 (5.02)

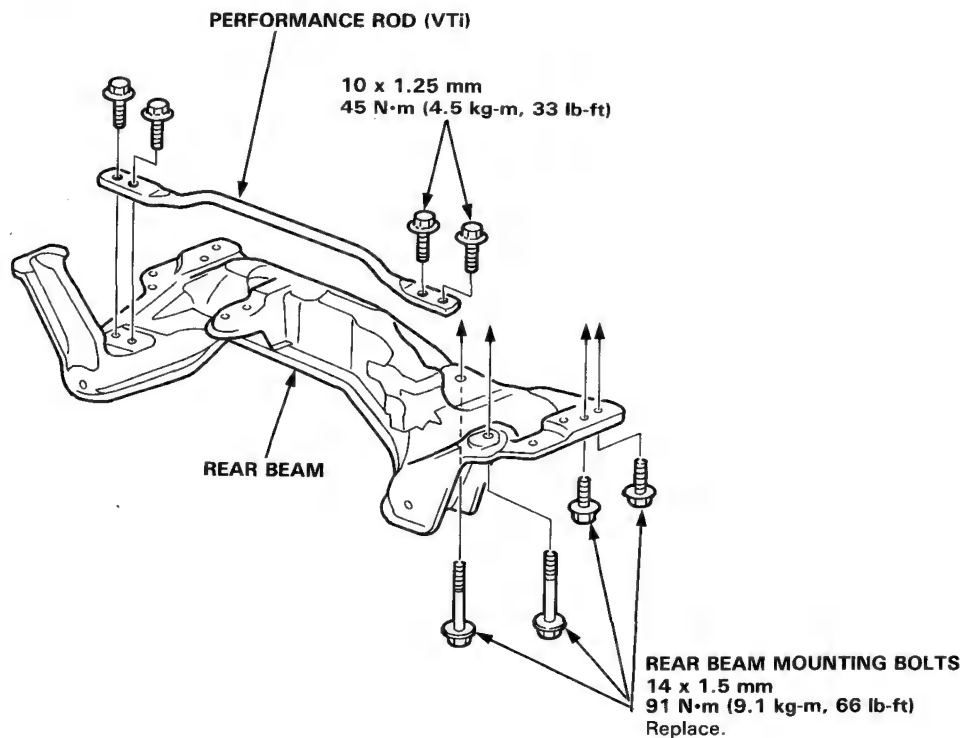
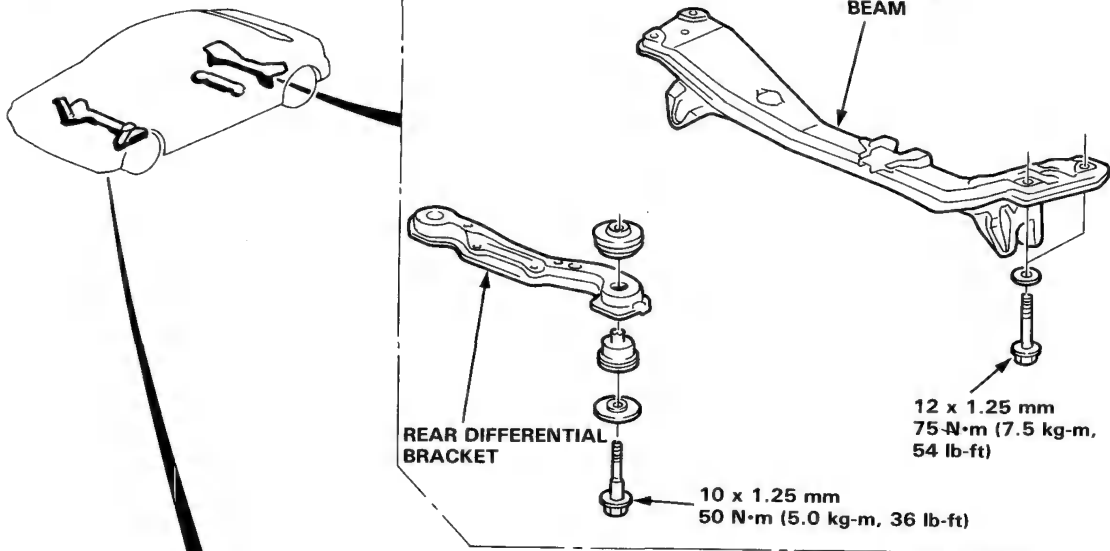


Emblem	C	D
Si	6 (0.24)	80 (3.15)
RTSi	12 (0.47)	64 (2.52)

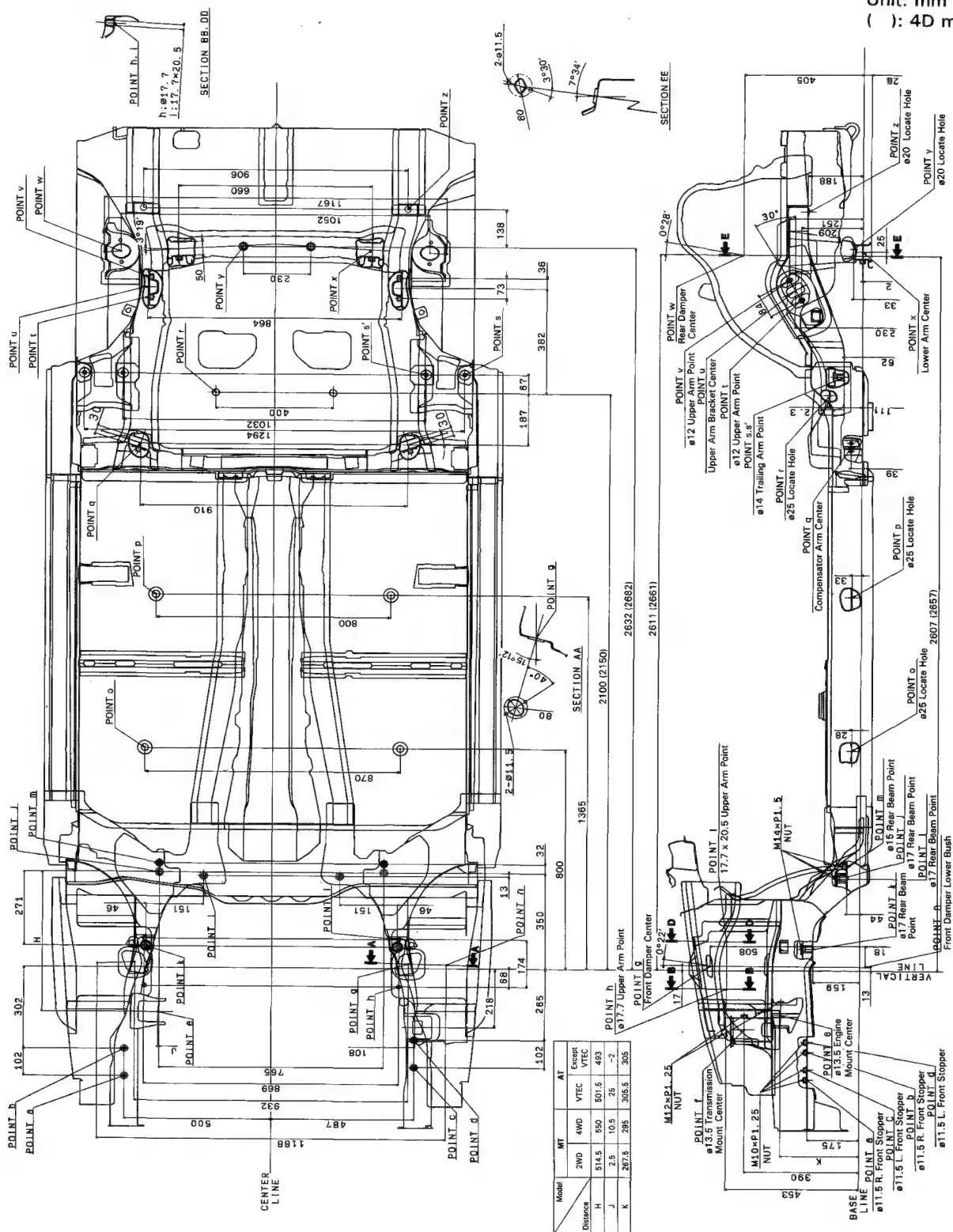
Sub-Frame

Sub-Frame Torque Sequence:

4WD:



Unit: mm
(): 4D model



4WD

Unit: mm



Heater and Air Conditioner

Heater	21-1
Air Conditioner	22-1

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if heater maintenance is required)

Some model versions of the CIVIC includes a driver's side airbag, located in the steering wheel hub, as part of a Supplemental Restraint System (SRS). Information necessary to safely service the SRS is included in this service manual. Items marked * on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special cautions and tools, and should therefore be done only by an authorized Honda dealer.

WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, can lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and the dashboard lower panel. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse box may affect the SRS and must therefore be performed by an authorized HONDA dealer.



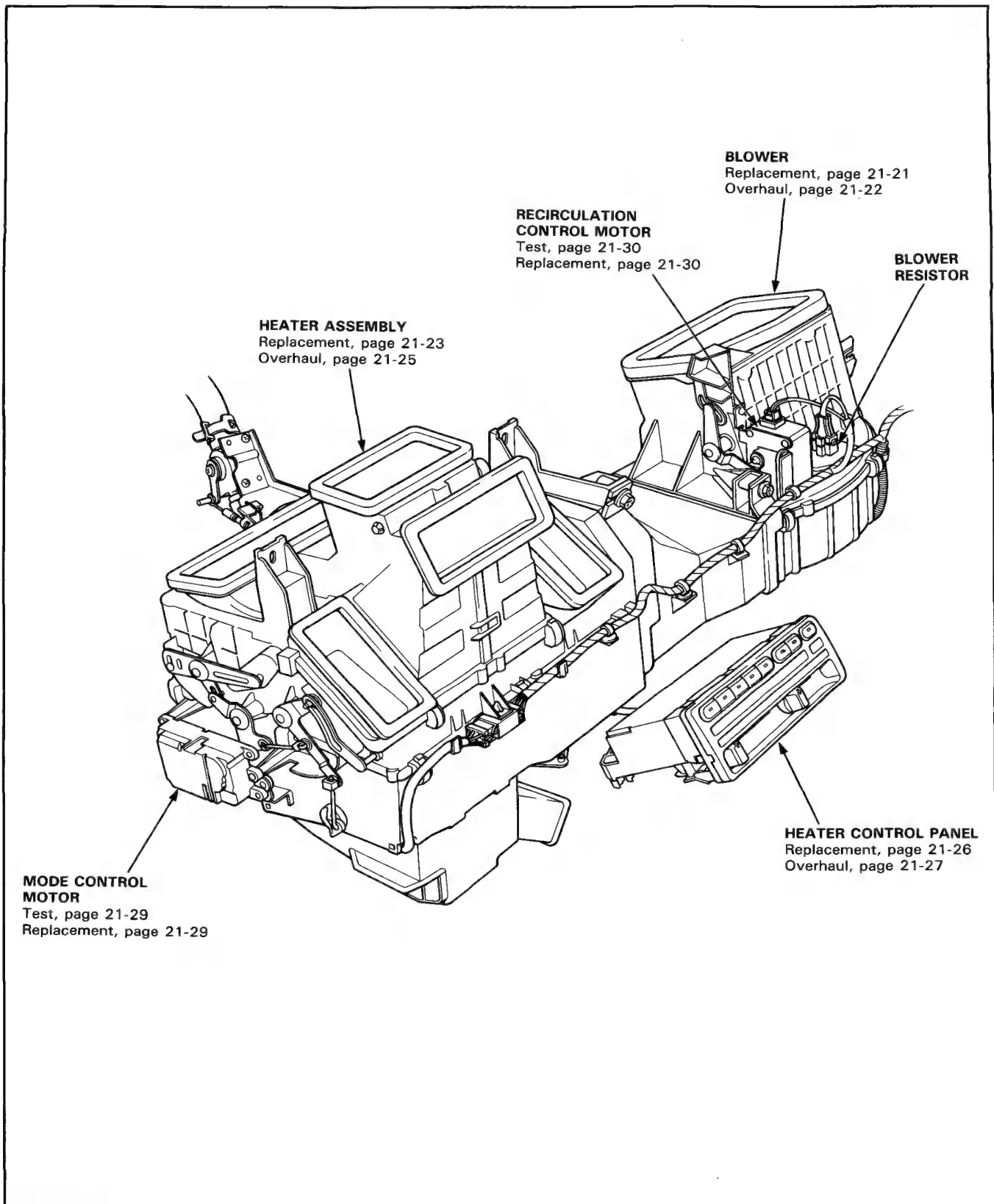
Heater

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*: Read SRS precautions before working in these areas.



Illustrated Index



Heater Door Positions (LH Type)



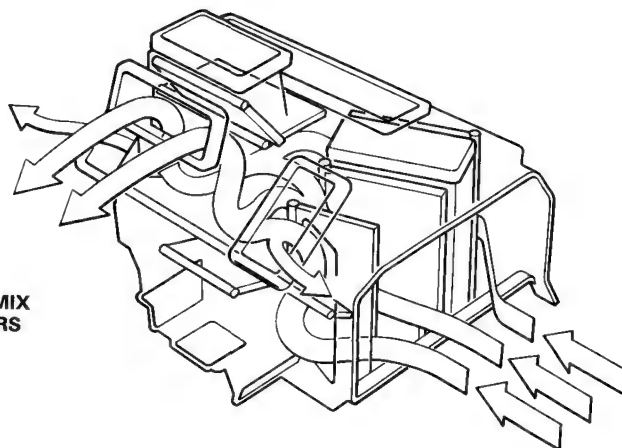
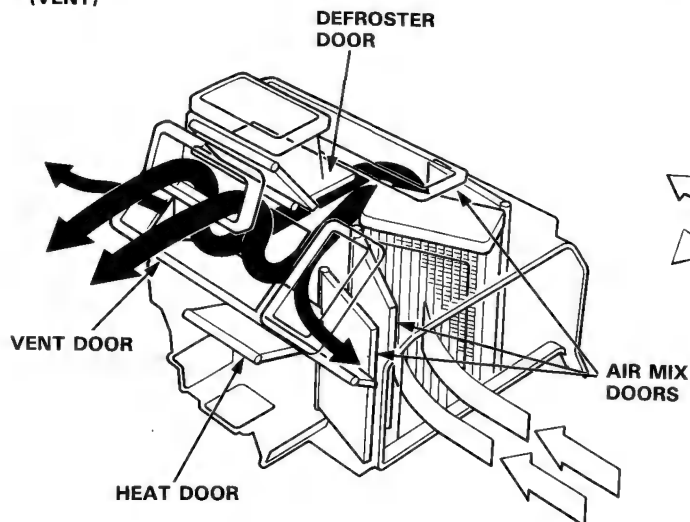
(VENT)



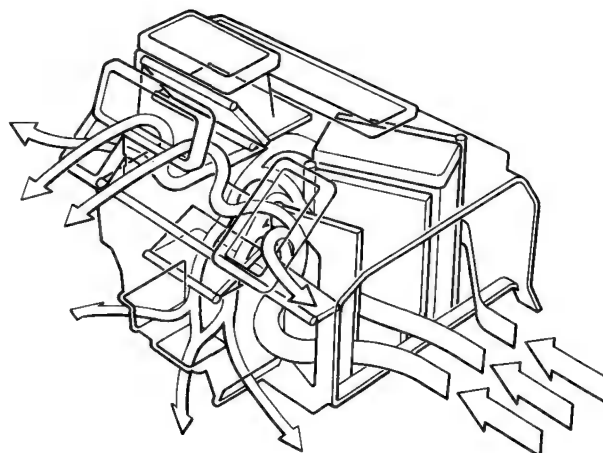
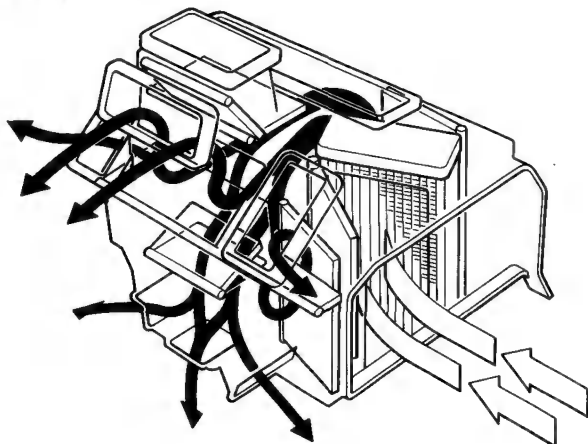
HOT



COLD



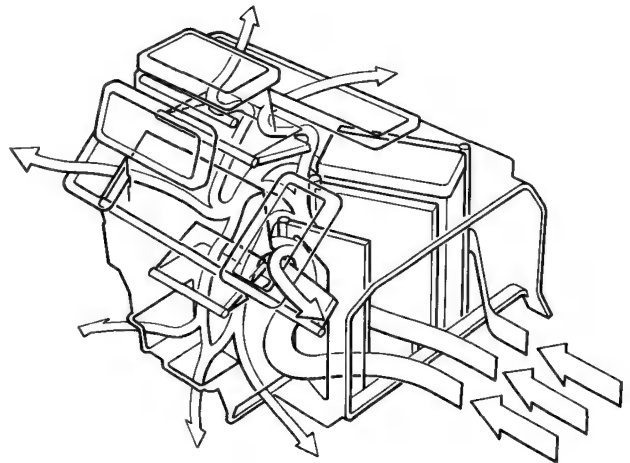
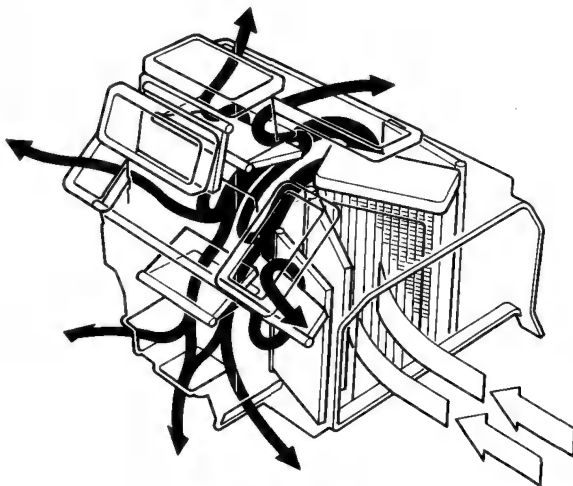
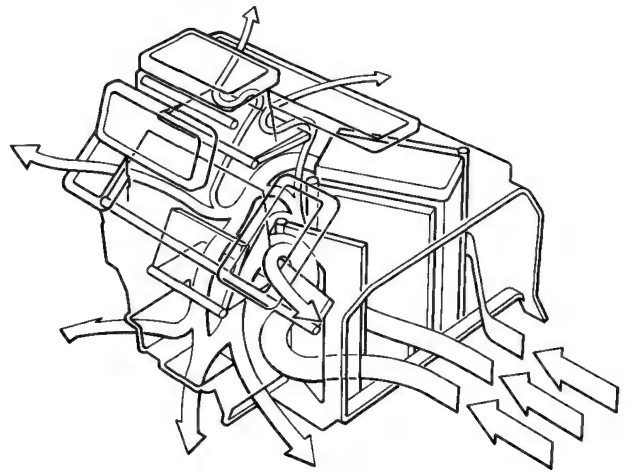
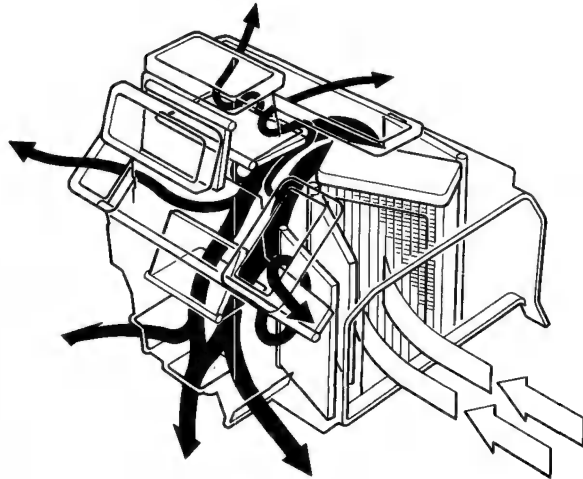
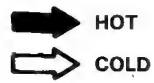
(HEAT/VENT)

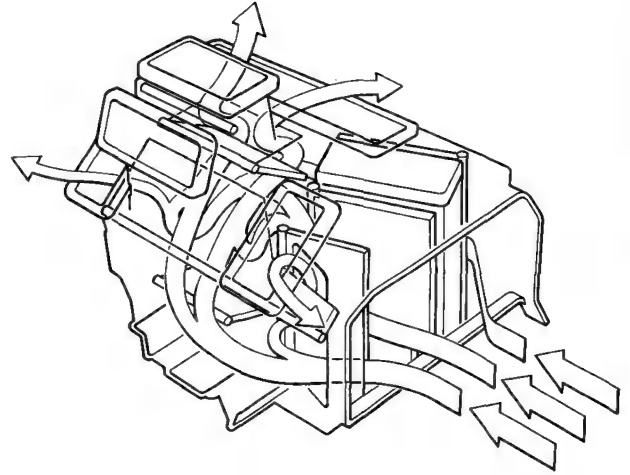
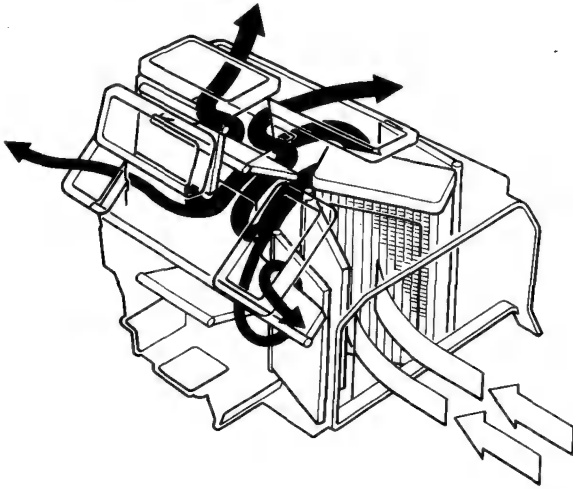
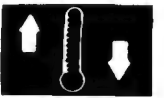


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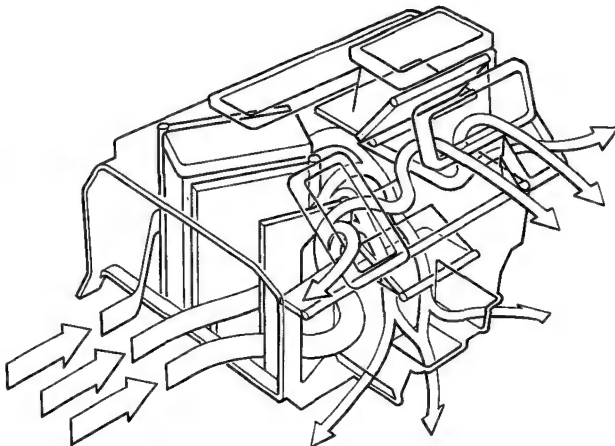
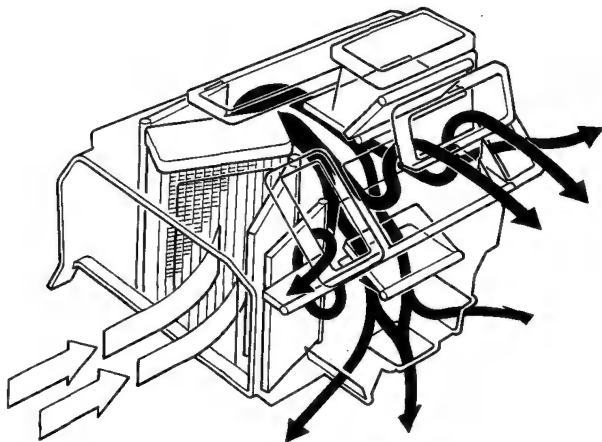
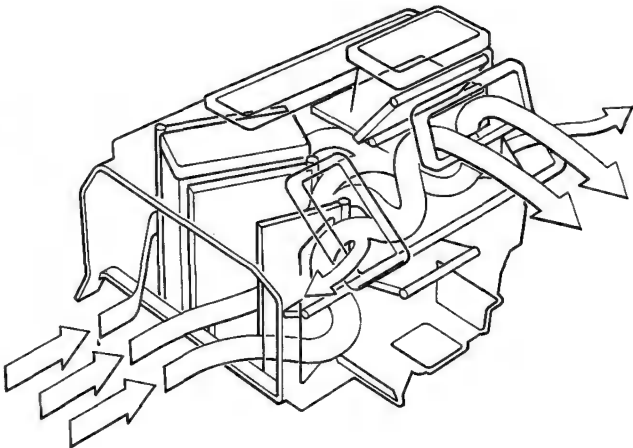
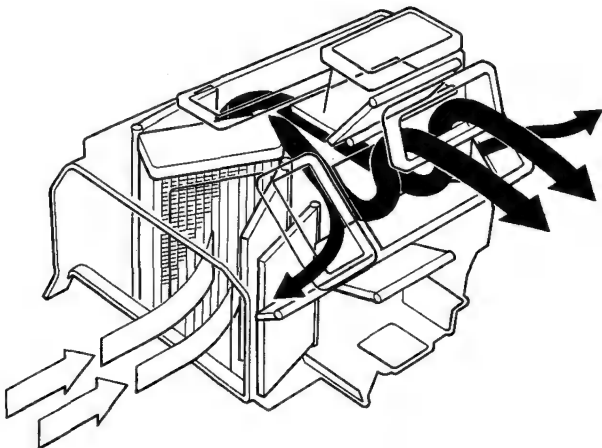
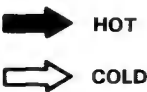
Heater Door Positions (LH Type)

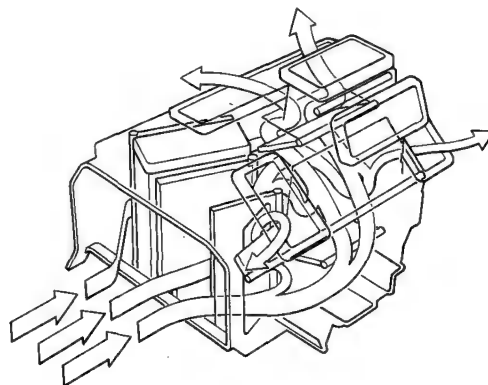
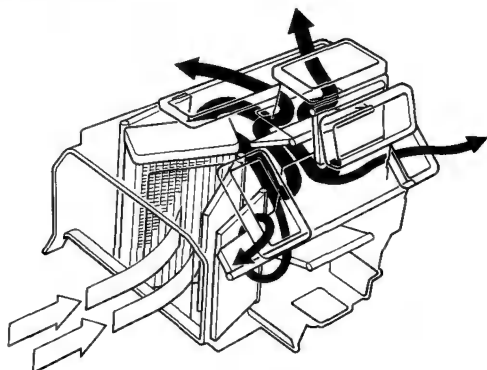
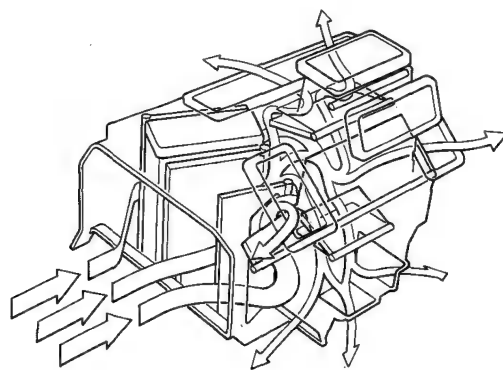
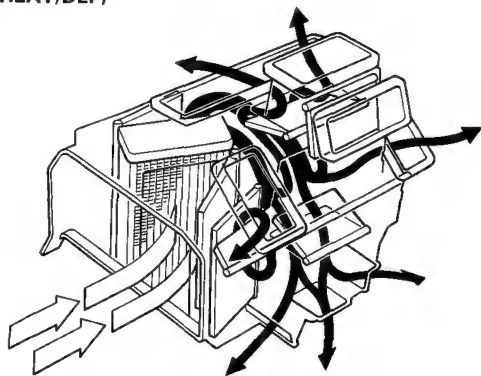
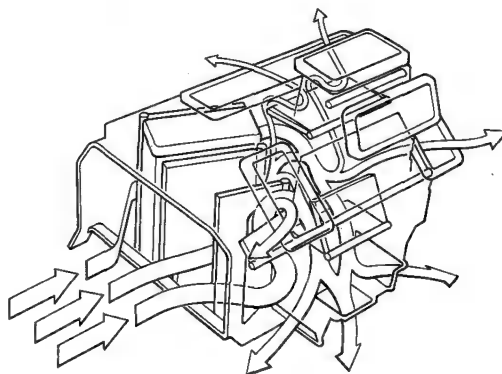
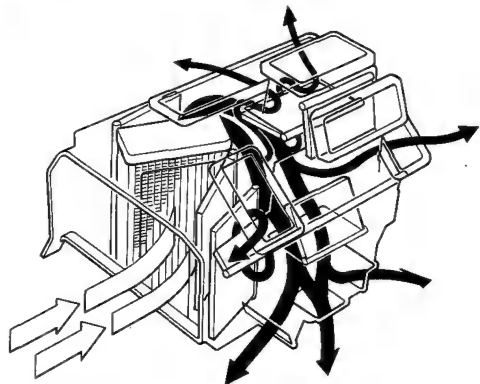
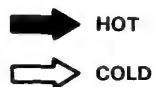
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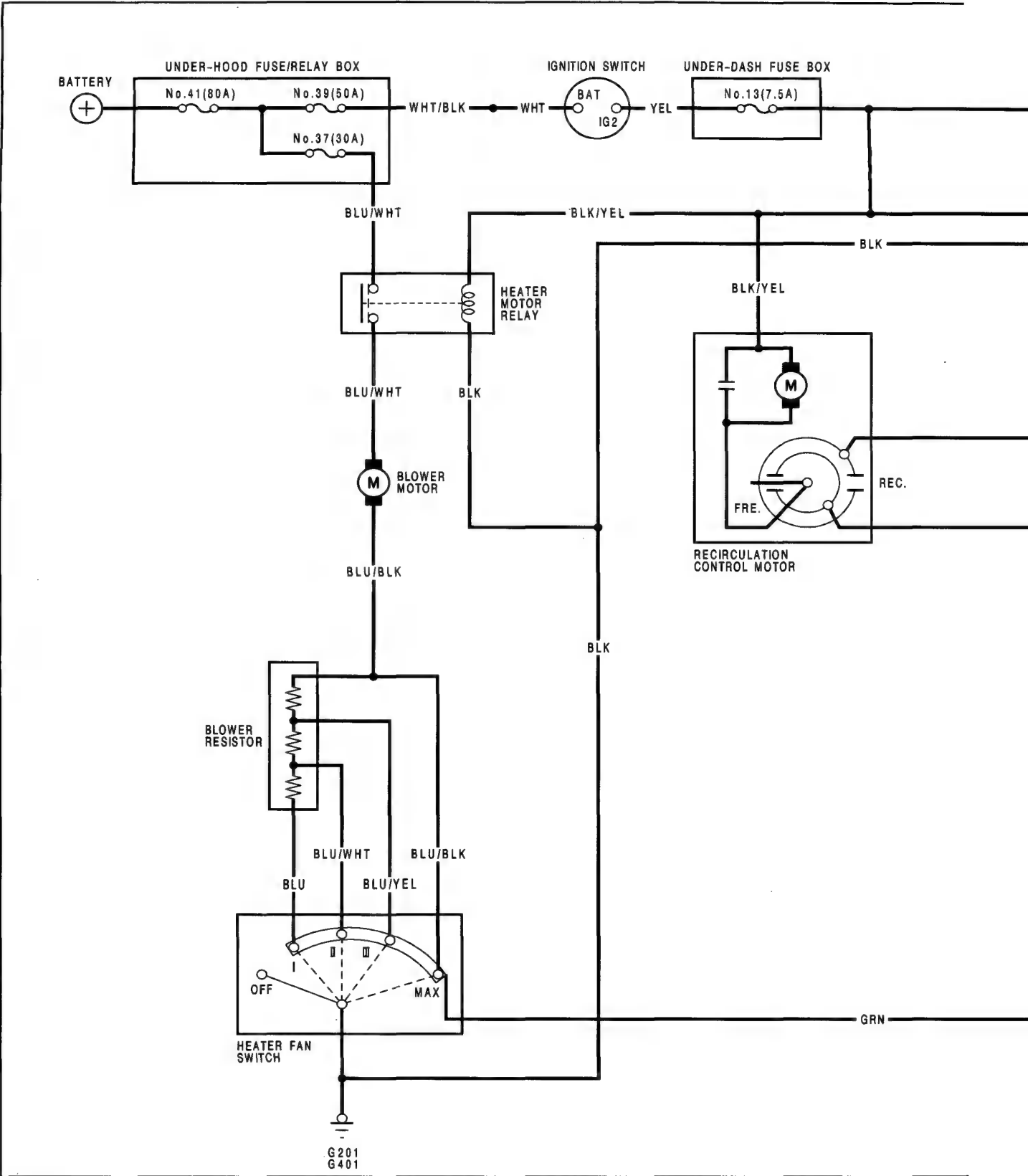


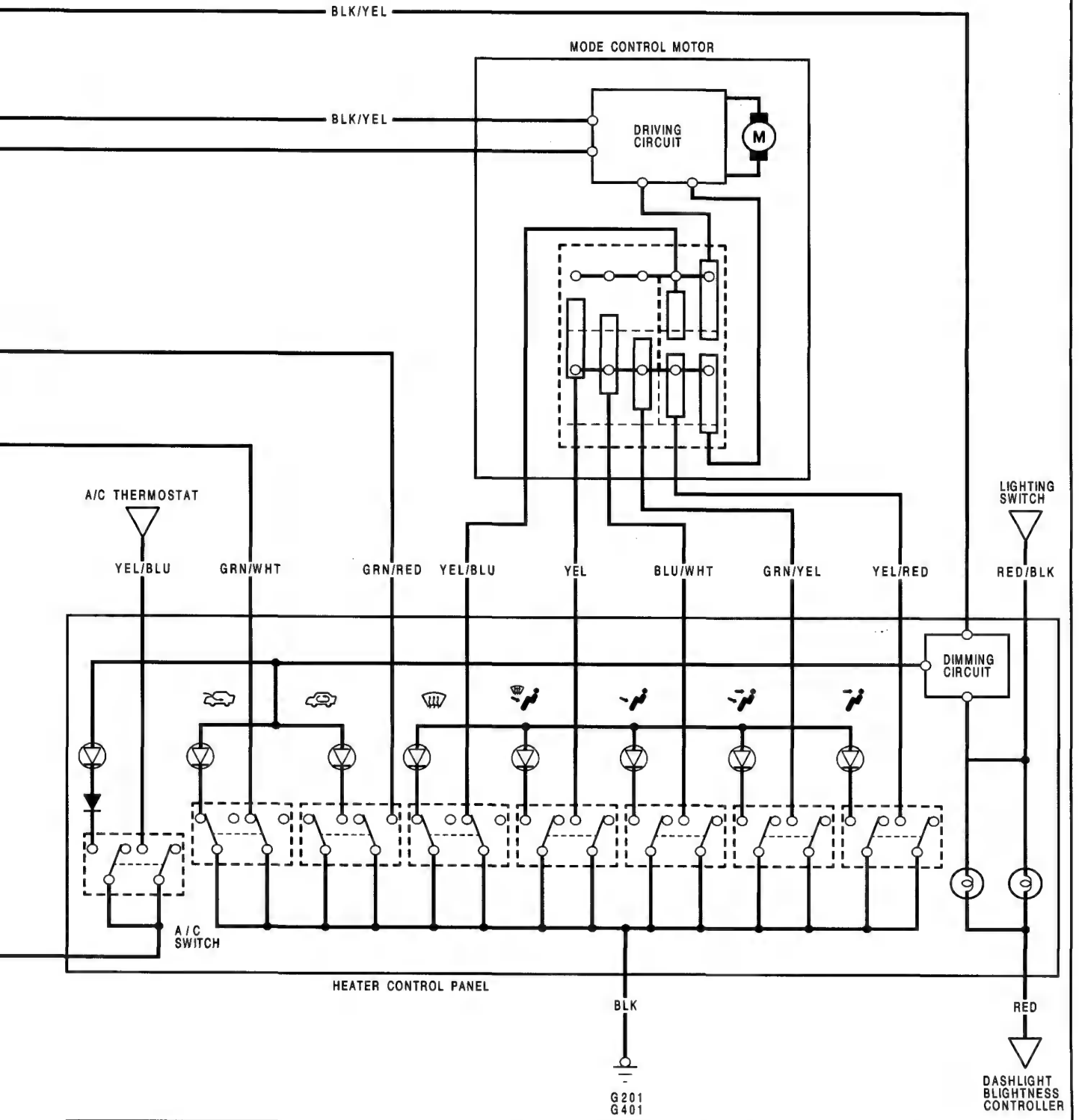
Heater Door Positions (RH Type)





Circuit Diagram





Troubleshooting

Symptom Chart

NOTE: Check the coolant level and allow the engine to warm up before troubleshooting.

SYMPTOM		REMEDY
No hot air flow	Blower motor does not run	Perform the flowchart (page 21-13).
	Blower motor runs	Check following: <ul style="list-style-type: none">• Clogged heater duct• Clogged blower outlet• Clogged heater valve• Faulty air mix door• Air mix cable adjustment• Faulty thermostat (section 10)• Clogged evaporator (with air conditioner)• Frozen evaporator (with air conditioner)
Hot air flow is low	Blower speed does not change	Perform the flowchart (page 21-11)
	Blower runs properly	Check following: <ul style="list-style-type: none">• Clogged heater duct• Clogged heater outlet• Incorrect door position
Air direction can't be controlled properly.		Perform the flowchart (page 21-16)
Recirculation function does not work properly.		Perform the flowchart (page 21-18)



Blower Motor Speeds

Blower motor runs, but one or more speeds are inoperative.

Turn the ignition switch ON, and the blower fan switch OFF.

Does the blower motor run?

YES

B To page 21-12

NO

Turn the ignition switch OFF.

Disconnect the blower resistor 4P connector.

Measure the resistance between the No. 2 and No. 4 terminals.

Is there continuity?

NO

Replace the blower resistor.

YES

Reconnect the blower resistor 4P connector.

Remove the heater control panel (page 21-26)

Disconnect the heater fan switch 6P connector.

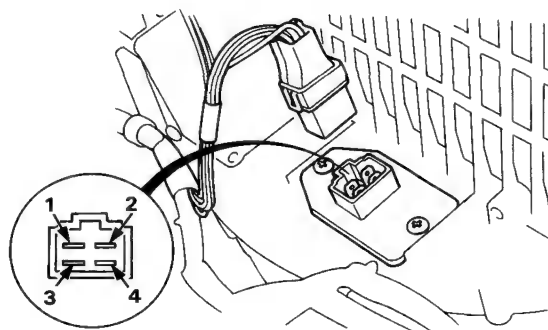
Turn the ignition switch ON.

At the heater fan switch 6P connector, ground each of these wires individually in the following order.

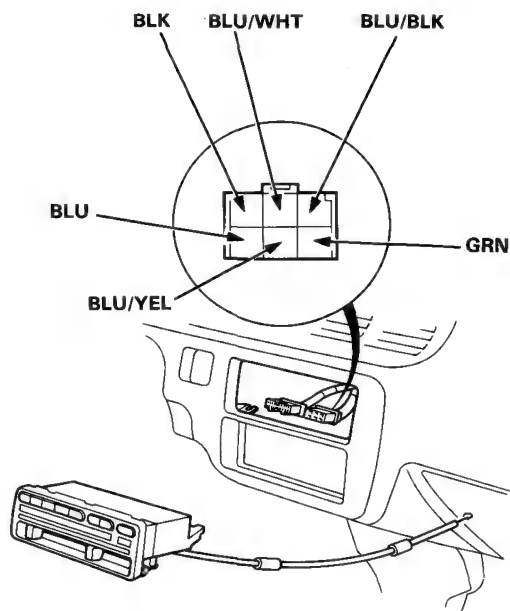
- BLU
- BLU/WHT
- BLU/YEL
- BLU/BLK

A

To page 21-12



View from terminal side



View from wire side

(cont'd)

Troubleshooting

Blower Motor Speeds (cont'd)

From page 21-11

A

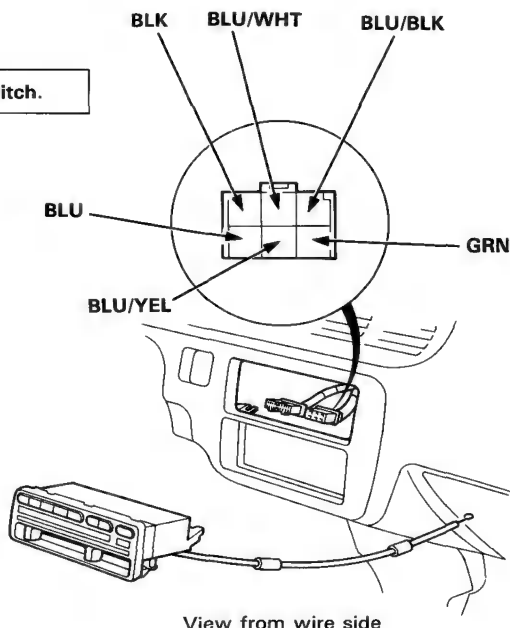
Does the blower motor run at progressively higher speeds?

YES

Replace the heater fan switch.

NO

Repair open, or cause of excessive resistance in the appropriate wire(s) between the heater fan switch and the blower resistor.



From page 21-11

B

Turn the ignition switch OFF.

Remove the heater control panel (page 21-26).

Disconnect the heater fan switch 6P connector.

Disconnect the blower resistor 4P connector.

Check each wire for continuity between the heater fan switch 6P connector and body ground.

- BLU
- BLU/WHT
- BLU/YEL
- BLU/BLK

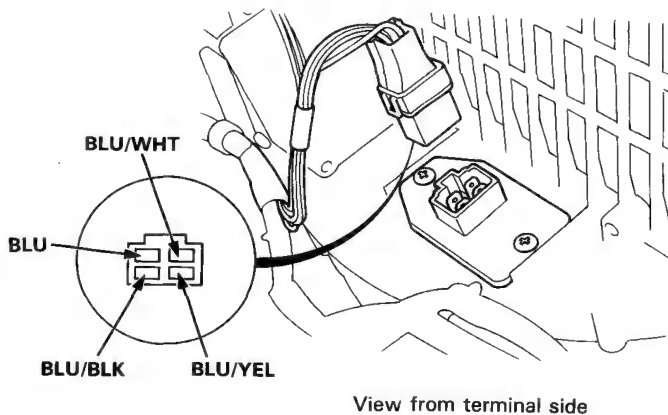
Is there continuity?

NO

Replace the heater fan switch.

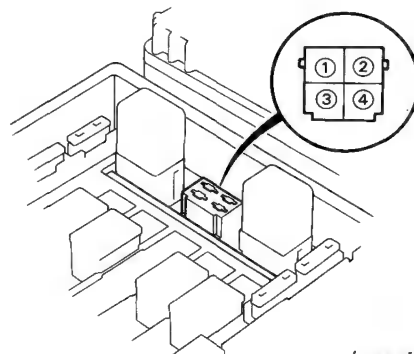
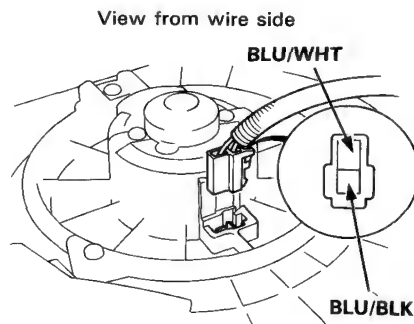
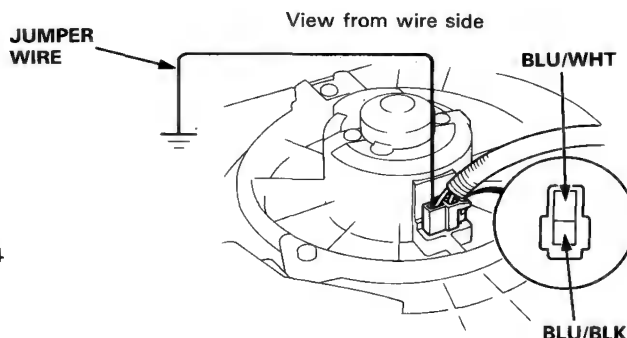
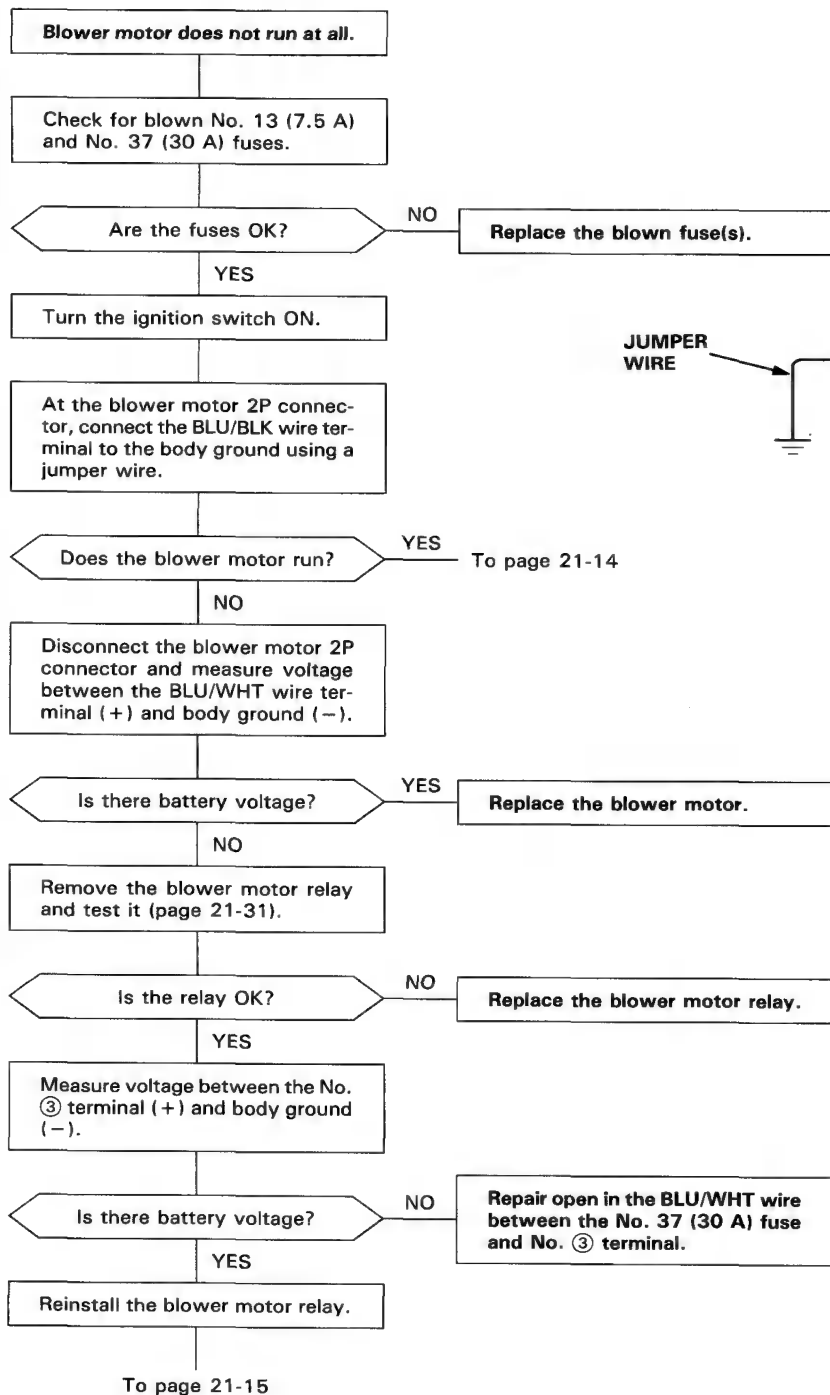
YES

Repair open in wire(s) between the heater fan switch and the blower resistor.





Blower Motor



(cont'd)

Troubleshooting

Blower Motor (cont'd)

From page 21-13

Turn the ignition switch OFF.

Remove the heater control panel
(page 21-26).

Disconnect the heater fan switch
6P connector.

Turn the ignition switch ON.

Measure voltage between the
BLU/BLK wire terminal (+) and
body ground (-).

Is there battery voltage?

NO

Repair open in the BLU/BLK wire
between the blower motor and
heater fan switch.

YES

Turn the ignition switch OFF.

Check for continuity in the BLK
wire between the heater fan switch
and body ground.

Is there continuity?

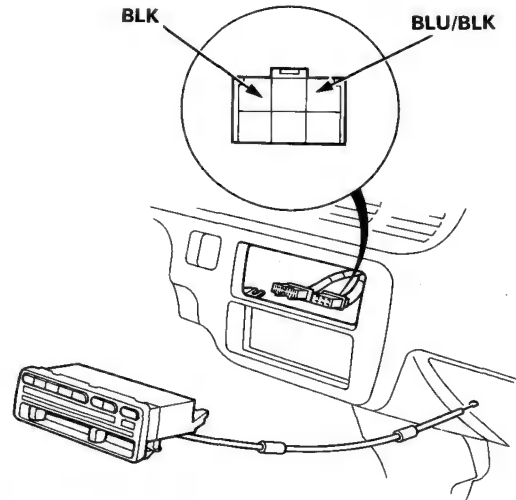
NO

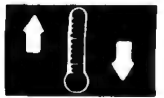
Repair open in the BLK wire be-
tween the heater fan switch and
body ground. If the wire is OK,
check for poor ground at G201
and 401.

YES

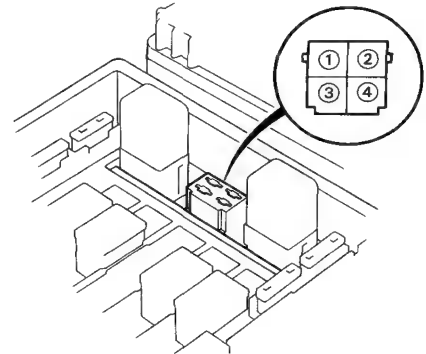
Replace the heater fan switch.

View from wire side





From page 21-13



Measure voltage between the No. ② terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/YEL wire between the No. 13 (7.5 A) fuse and No. ② terminal.

YES

Turn the ignition switch OFF.

Check for continuity between the No. ④ terminal and body ground.

Is there continuity?

NO

Repair open in the BLK wire between the No. ④ terminal and body ground. If the wire is OK, check for poor ground at G201 and 401.

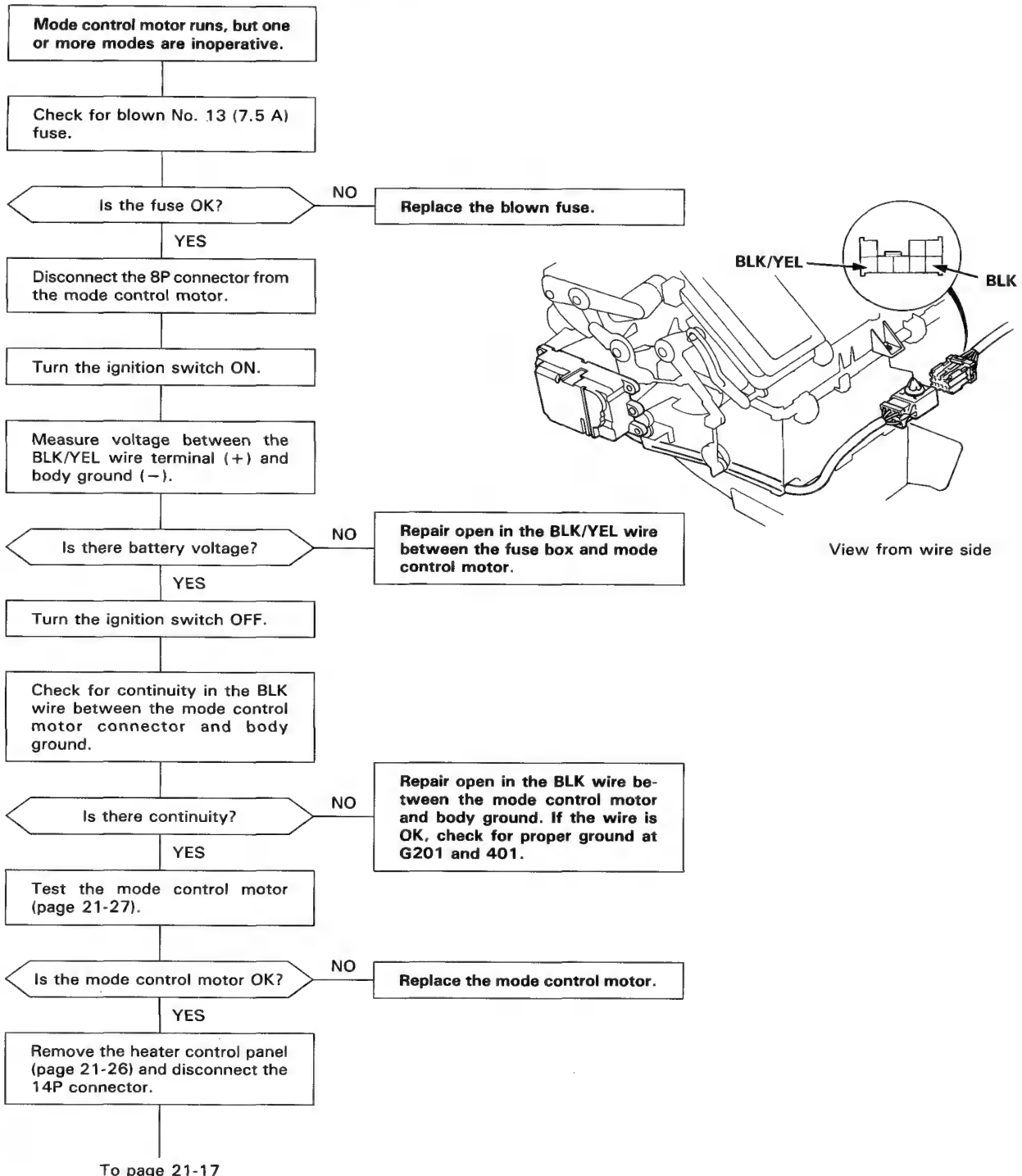
YES

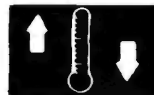
Repair open in the BLU/WHT wire between the blower motor relay and blower motor.

Troubleshooting

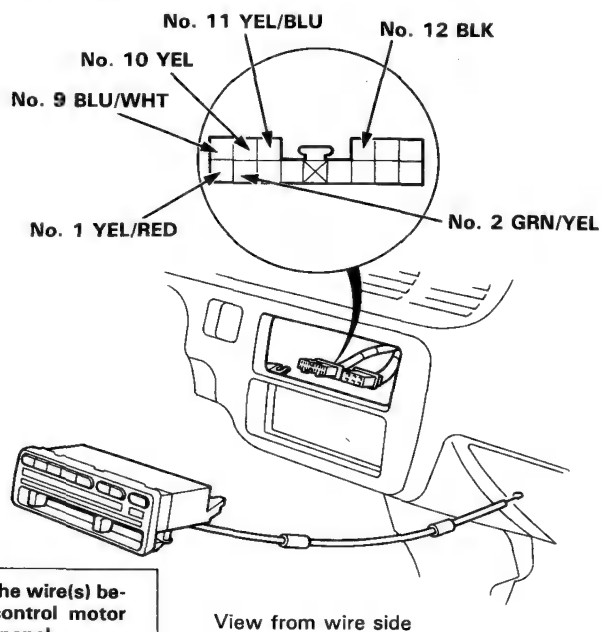
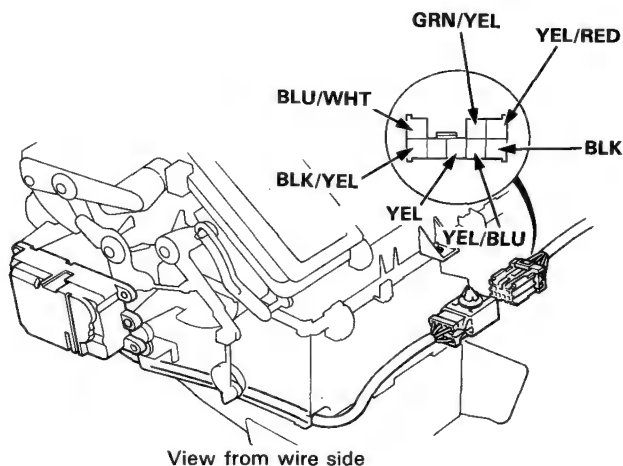
Mode Control

NOTE: Before troubleshooting, check the mode link and mode doors for sticking.





From page 21-16



Check each wire for continuity between the mode control motor and heater control panel.

- YEL/BLU
- YEL
- BLU/WHT
- GRN/YEL
- YEL/RED

Is there continuity?

NO

Repair any open in the wire(s) between the mode control motor and heater control panel.

YES

Check for continuity in the BLK wire between the heater control panel and body ground.

Is there continuity?

NO

Repair open in the BLK wire between the heater control panel and body ground. If the wire is OK, check for proper ground at G201 and 401.

YES

Replace the heater control panel.

Troubleshooting

Recirculation Control

NOTE: Before troubleshooting, check the recirculation control link and door for sticking.

Recirculation control door does not change between FRESH and REC.

Check for blown No. 13 (7.5 A) fuse.

Is the fuse OK?

NO

Replace the blown fuse.

YES

Disconnect the recirculation control motor 4P connector.

Turn the ignition switch ON.

Measure voltage between the BLK/YEL terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/YEL wire between the fuse box and recirculation control motor.

YES

Turn the ignition switch OFF.

Test the recirculation control motor (page 21-30).

Is the recirculation control motor OK?

NO

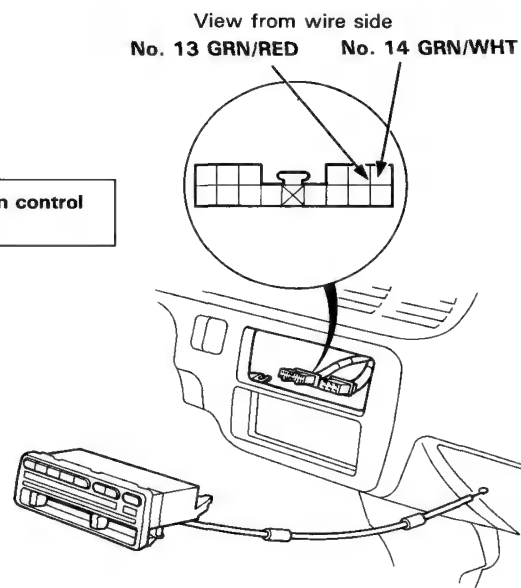
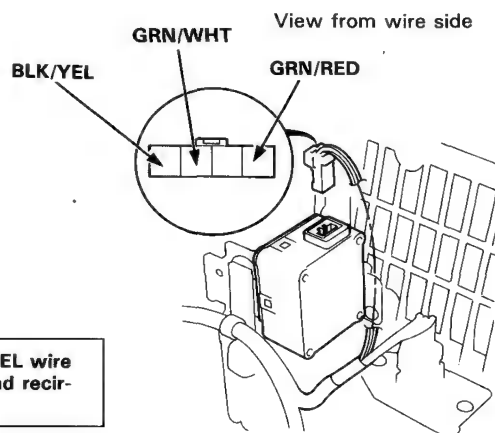
Replace the recirculation control motor.

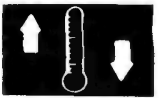
YES

Remove the heater control panel (page 21-26) and disconnect the 14P connector from the heater control panel.

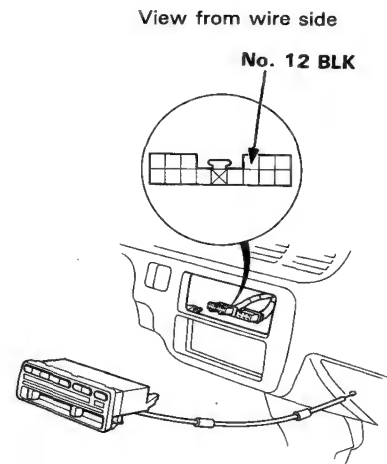
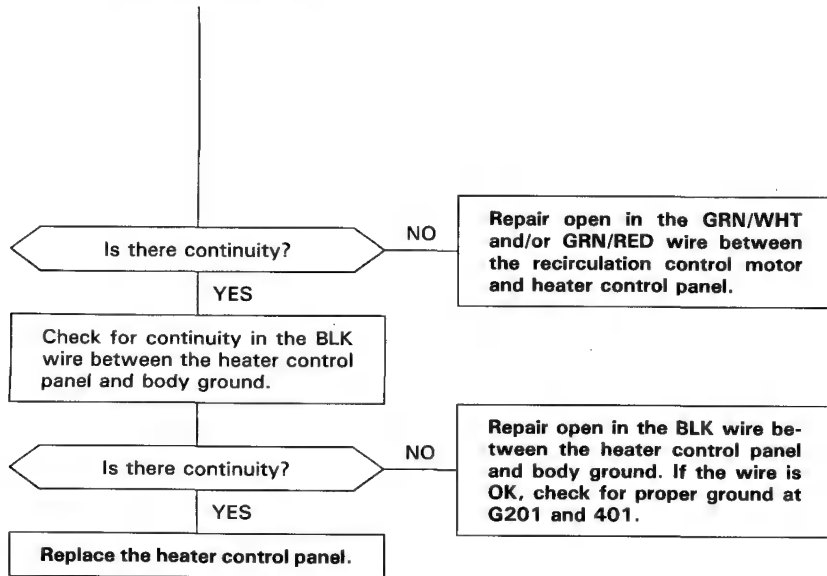
Check for continuity in the GRN/WHT and GRN/RED wire between the recirculation control motor and heater control panel.

To page 21-19



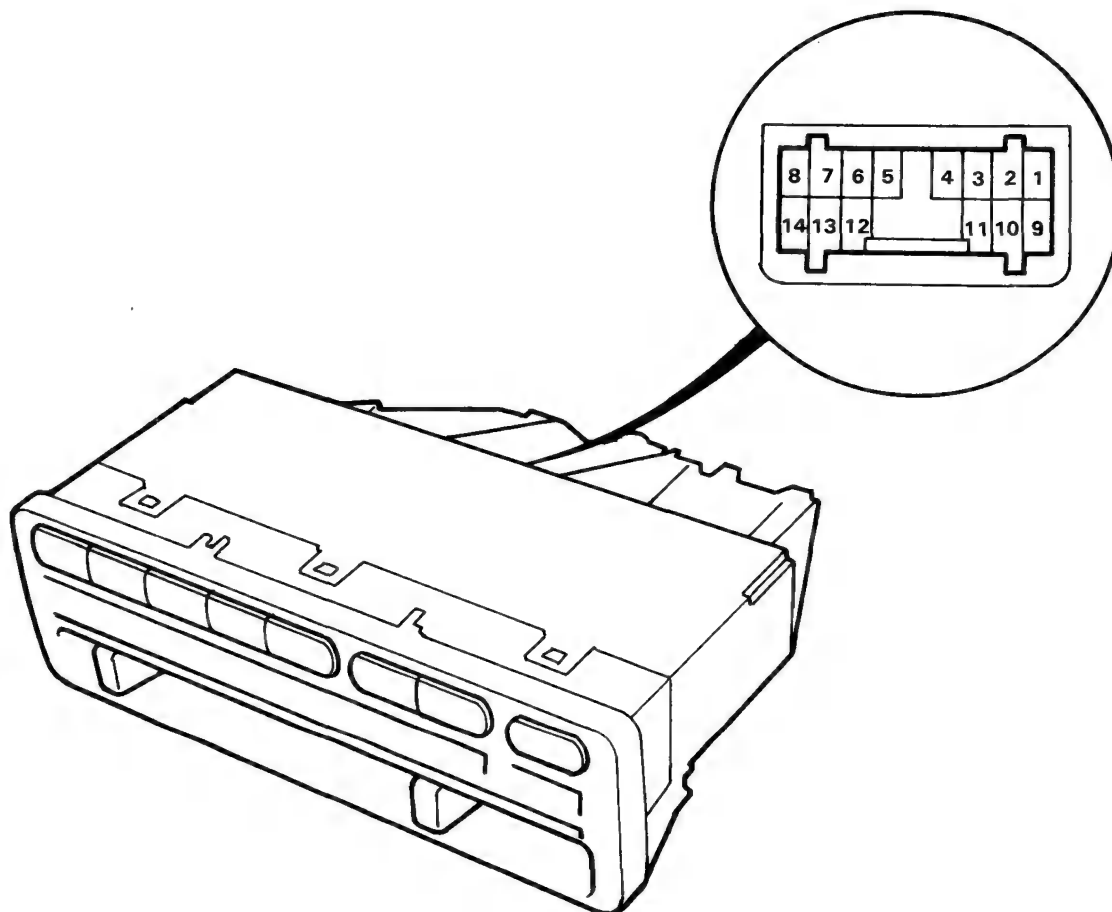


From page 21-18



Troubleshooting

Heater Control Panel Input/Output Signals



Wire Position		Signal	Wire Position		Signal
1	YEL/RED	VENT	8	BLK/YEL	IG2
2	GRN/YEL	HEAT/DEF	9	BLU/WHT	HEAT
3	RED/BLK	LIGHTING SWITCH	10	YEL	HEAT/VENT
4	RED	ILLUMINATION CONTROL	11	YEL/BLU	DEF
5	BLU/RED	THERMOSTAT	12	BLK	GROUND
6	GRN	HEATER FAN SWITCH	13	GRN/RED	RECIRCULATION ⊕
7			14	GRN/WHT	FRESH ⊕

Blower Assembly

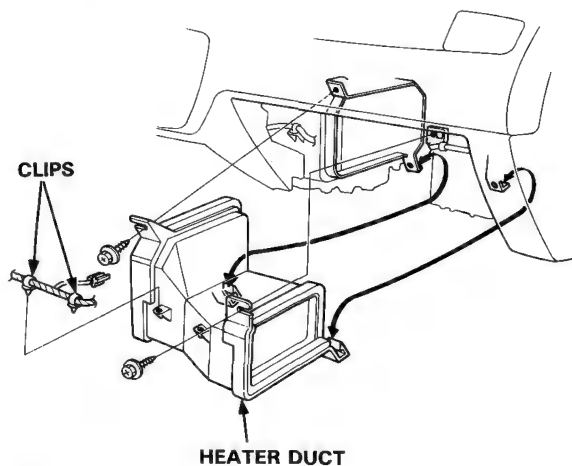
Replacement

NOTE: The blower motor, recirculation control motor, and resistor can be replaced without removing the blower assembly (see page 21-22).

1. Disconnect the battery negative terminal.
2. Remove the glove box and glove box frame (section 20).

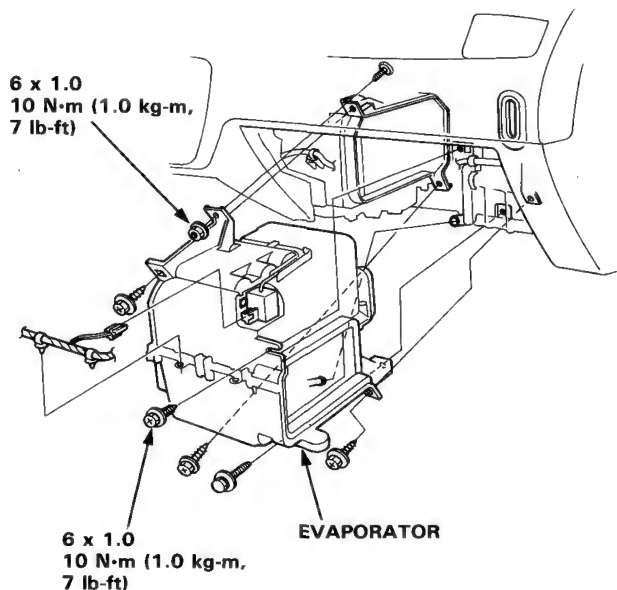
WITHOUT AIR CONDITIONER

- 3-a. Remove the clips from the heater duct.
Remove the tapping screws (2) and remove the heater duct.

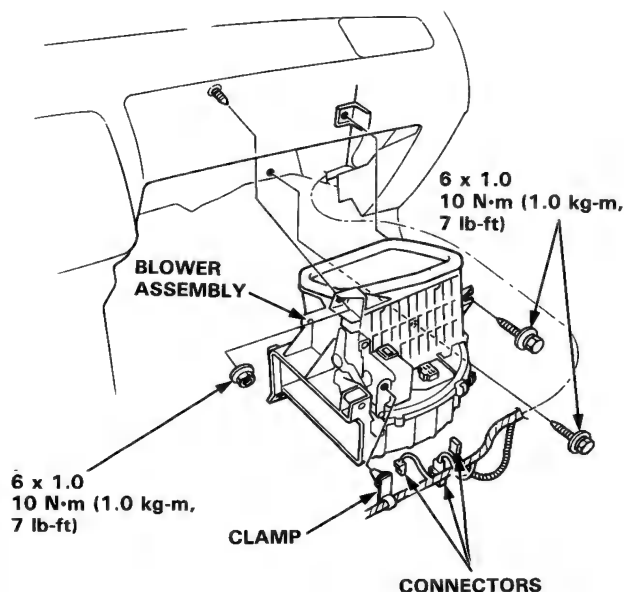


WITH AIR CONDITIONER

- 3-b. Remove the evaporator (page 22-23).



4. Disconnect the connectors from the blower motor, resistor and recirculation control motor.
5. Remove the clamp from the recirculation control motor and release the wire harness from the clamp on the blower assembly.
Remove the bolts (2), nut and blower assembly.



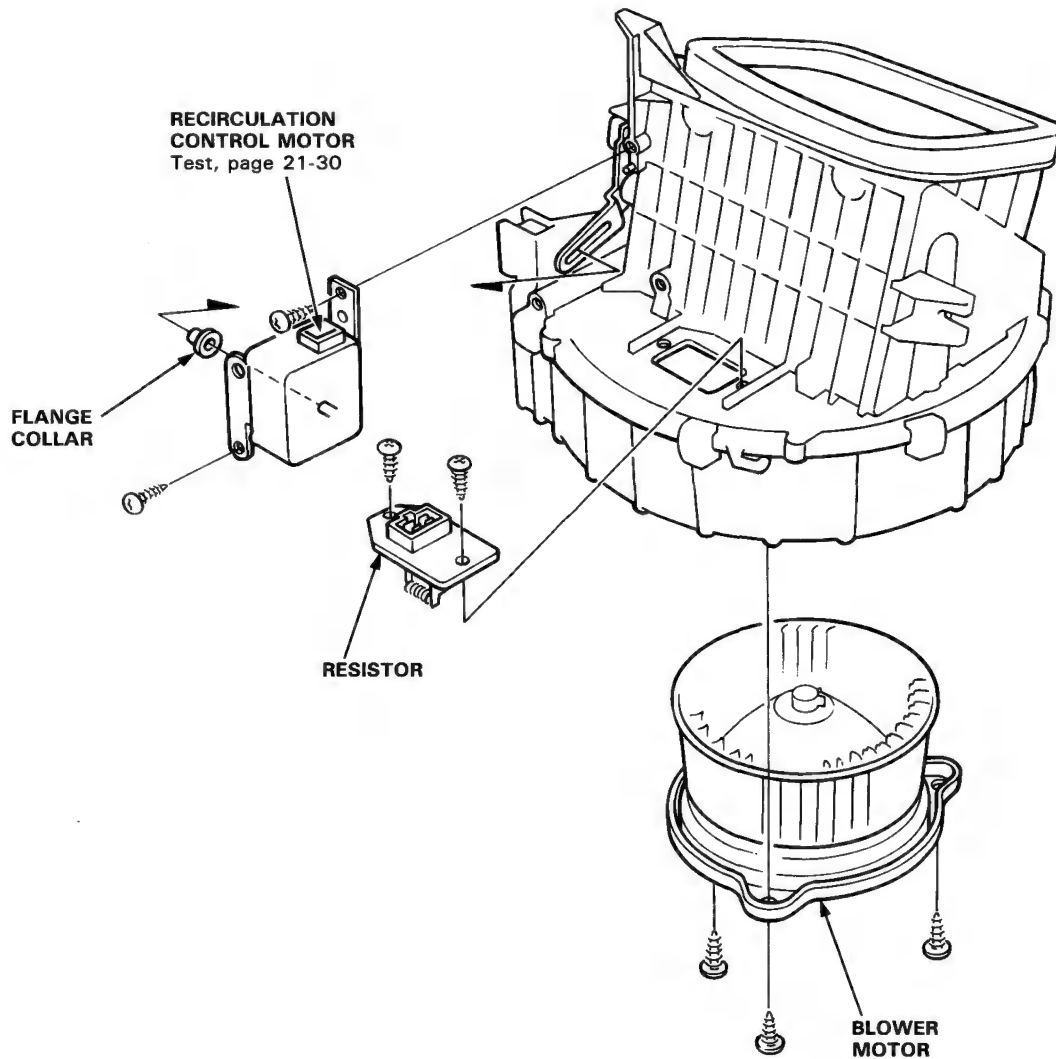
6. Install the blower assembly in the reverse order of removal and make sure there is no air leakage.

Blower Assembly

Overhaul

NOTE:

- Before reassembly, make sure that the air door and linkage moves smoothly without binding.
- When reattaching the actuator, make sure its positioning will not allow the air door to be pulled too far. Attach the actuator and all linkage, then apply battery voltage and watch the door movement. If necessary, loosen the holding screw and move the actuator up or down.



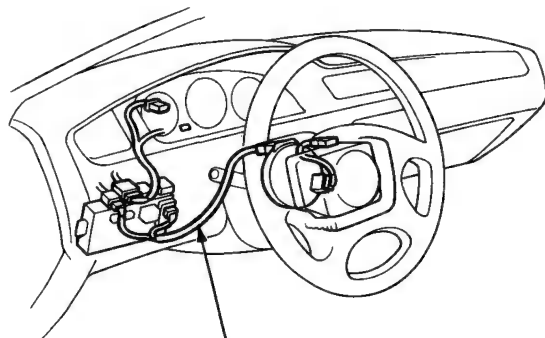
Heater Assembly

Replacement

SRS wire harnesses are routed near the heater.

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Before disconnecting the SRS wire harness, install the short connector on the airbag (see page 23-273).
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.



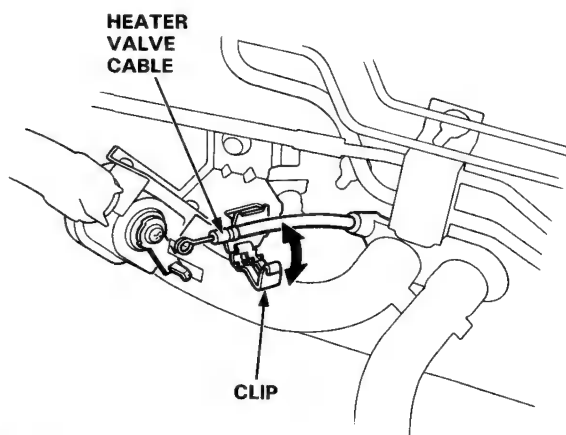
SRS MAIN HARNESS

1. When the engine is cool, drain coolant from the radiator (section 10).

⚠ WARNING

- Do not remove the radiator cap when the engine is hot; the coolant is under pressure and could severely scald you.
- Keep hands away from the radiator fan. The fan may start automatically without warning and run for up to minutes even after the engine is turned off.

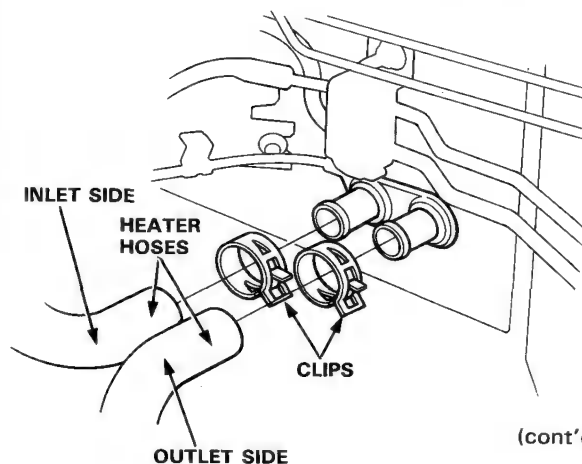
2. Snap open the cable clip and disconnect the heater valve cable from the heater valve.



3. Disconnect the heater hoses at the heater.

CAUTION: Radiator coolant will damage paint. Quickly rinse any spilled coolant from painted surfaces.

NOTE: Coolant will run out when the hoses are disconnected, drain it into a clean drip pan.

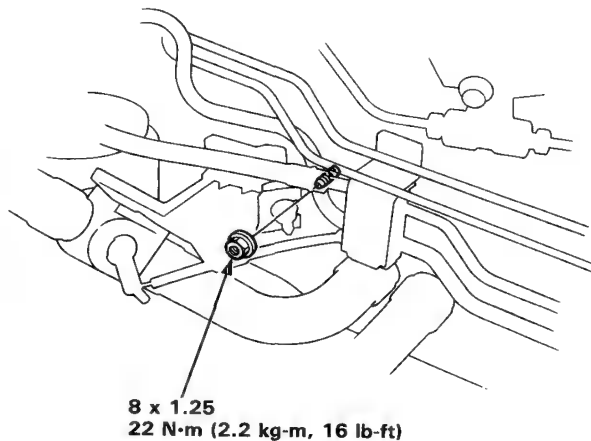


(cont'd)

Heater Assembly

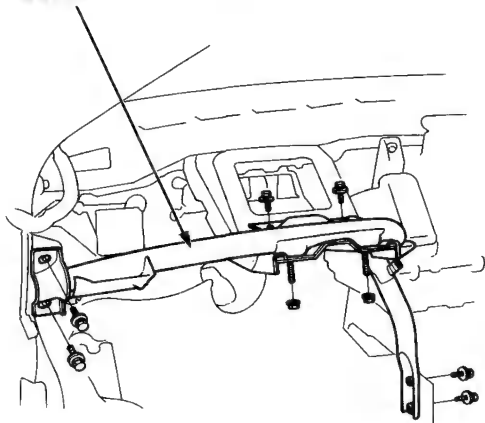
Replacement (cont'd)

4. Remove the heater unit mounting nut from the engine compartment side.



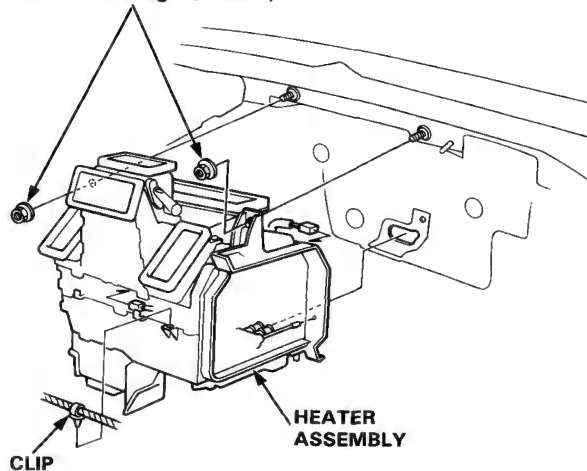
5. Remove the dashboard (section 20).
6. Remove the heater duct (page 21-21).
7. Remove the steering column bracket.

**STEERING COLUMN
BRACKET**



8. Remove the clip, heater mounting nuts (2) and heater assembly.

6 x 1.0
10 N·m (1.0 kg-m, 7 lb-ft)



9. Install the removed parts in the reverse order of removal, and:

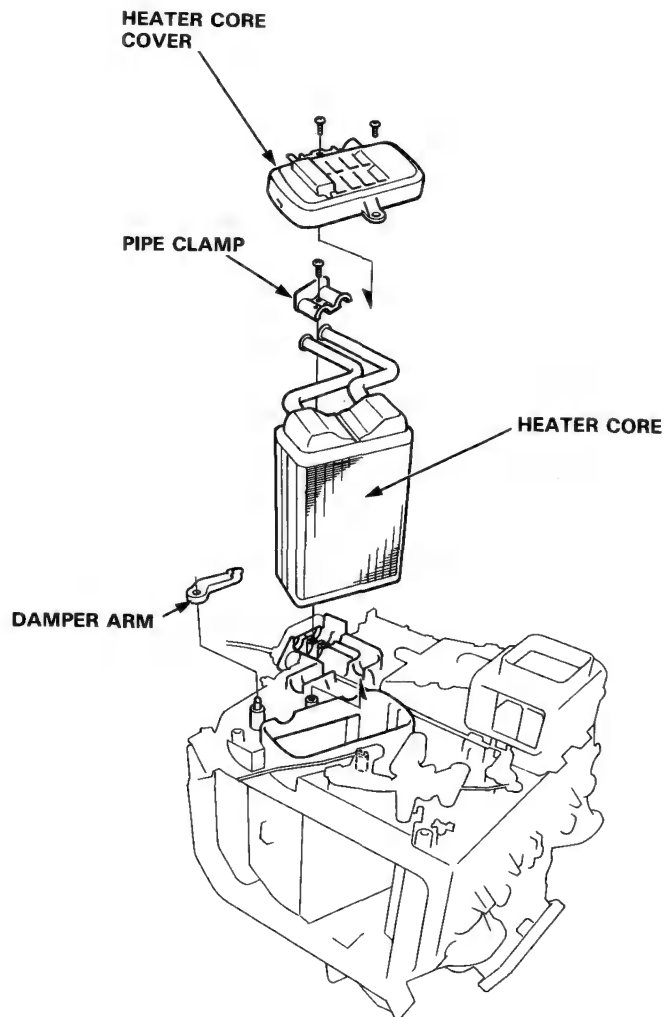
- Do not interchange the inlet and outlet hoses.
- Loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper coolant mixture.
Tighten the bleed bolt when all the trapped air has escaped and coolant begins to flow from it.
- Connect all cables and make sure they are properly adjusted (page 21-28).



Overhaul

1. Remove the heater assembly (page 21-23).
2. Remove the screws (2) and heater core cover.
3. Remove the screw and pipe clamp.
4. Remove the screw and damper arm.
5. Pull the heater core from the heater housing.

NOTE: Be careful not to bend the inlet and outlet pipes during heater core removal.



Install the removed parts in the reverse order of removal and:
Loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper coolant mixture.
Tighten the bleed bolt when all the trapped air has escaped and coolant begins to flow from it.

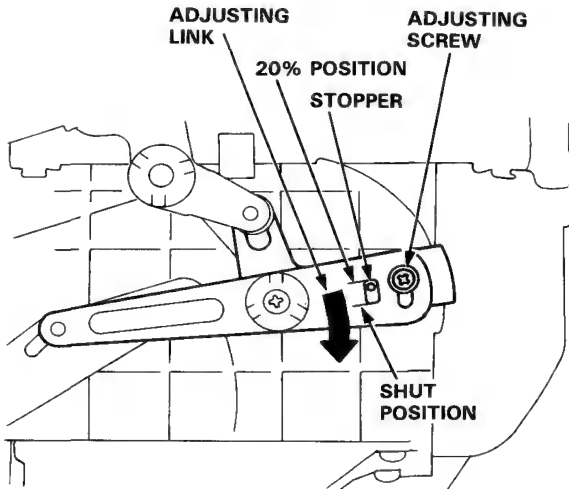
Heater Assembly

Heater Leakage Adjustment

DEF Door Adjustment

Set the heater control switch on HEAT for adjusting DEF leak (shut ~ 20%).

1. Loosen the adjusting screw.
2. Turn the adjusting link in the direction as shown as far as it goes.
3. Tighten the adjusting screw.

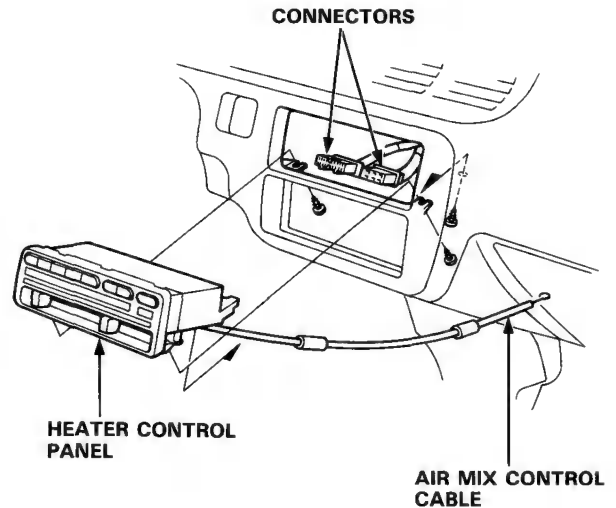


Heater Control Panel

Replacement

1. Remove the center lower panel (section 20).
2. Remove the radio (section 23).
3. Disconnect the air mix control cable from the heater unit (page 21-27).
4. Remove the self-tapping screws (3). Disconnect the connectors and remove the heater control panel.

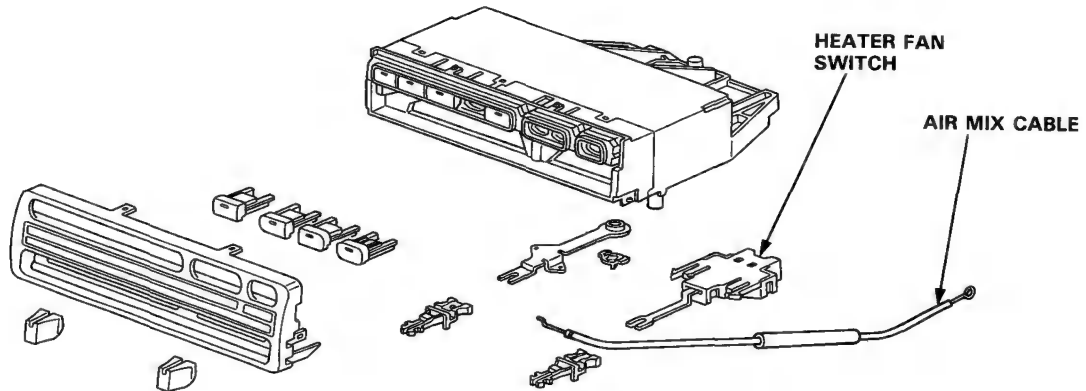
NOTE: The locking tabs are on the bottom of the connectors.



5. Install the removed parts in the reverse order of removal and refer to page 21-28 for air mix control cable installation.

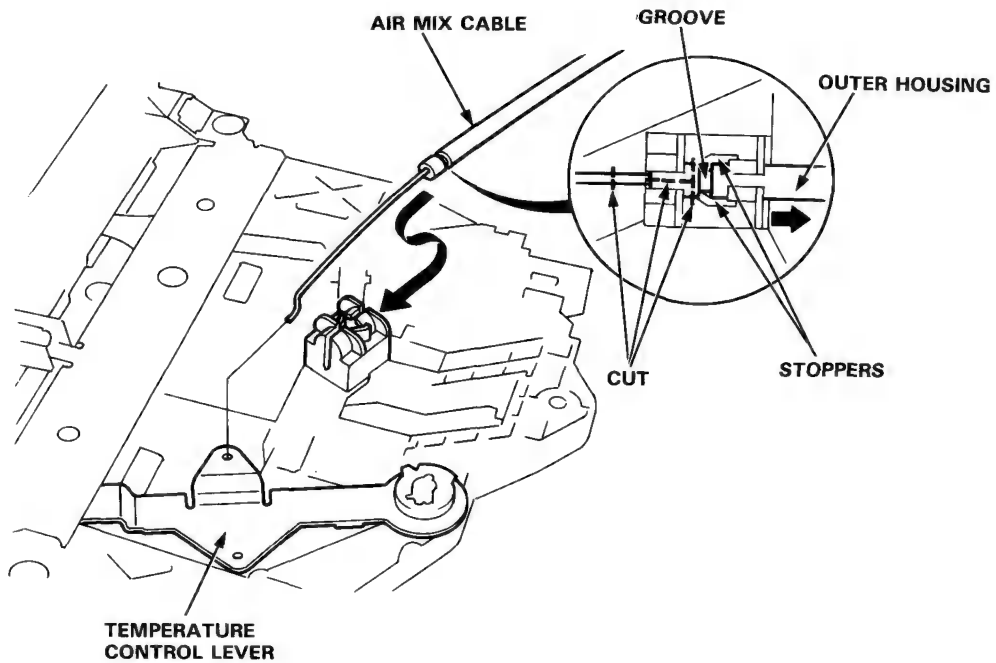


Overhaul



Air Mix Cable Replacement

1. Cut and pull out the heater valve cable.
2. Hook the tip of the new cable to the temperature control lever and push the cable outer housing until it is locked.

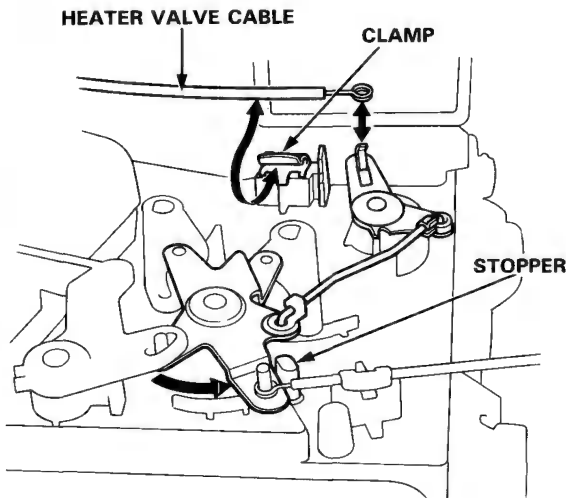


NOTE: After assembly check that the temperature control lever slides smoothly through the full stroke from right to left.

Heater Control Cables

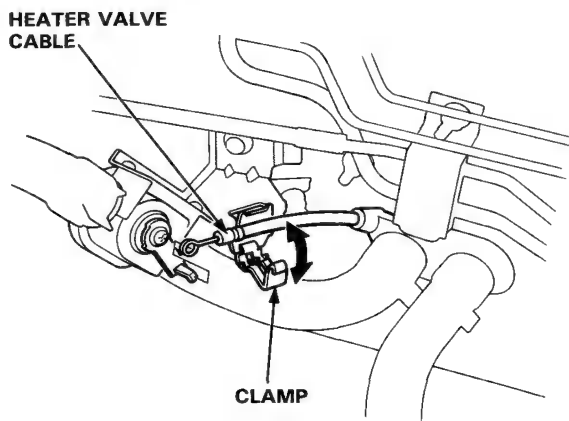
Heater Valve Cable Adjustment

1. Set the temperature control lever on COOL.
2. Turn the cable arm to the stopper and connect the end of the cable to the arm.
3. Gently slide the cable outer housing back from the end enough to take up any slack in the cable, but not enough to make the temperature control lever move, then snap the cable housing into the clamp.



4. Turn the water valve arm to shut and connect the end of the cable to the arm.
5. Gently slide the cable outer housing back from the end enough to take up any slack in the cable, but not enough to make the temperature control lever move, then snap the cable housing into the clamp.

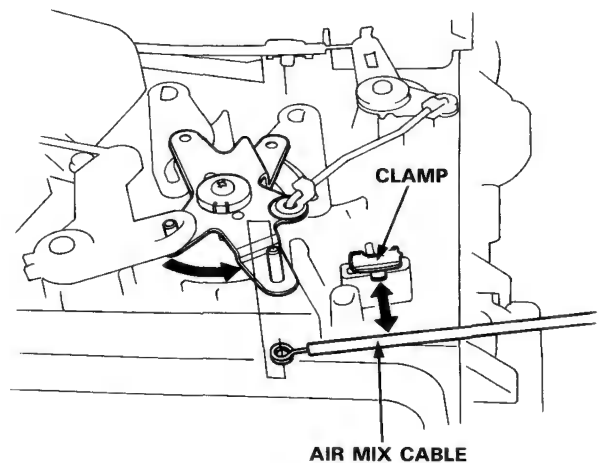
NOTE: Heater valve cable should be adjusted if the air mix cable has been disconnected.



Air Mix Cable Adjustment

1. Disconnect the air mix cable.
2. Turn the cable arm to the stopper and connect the end of the cable to the arm.
3. Gently slide the cable outer housing back from the end enough to take up any slack in the cable, but not enough to make the temperature control lever move, then snap the cable housing into the clamp.

NOTE: Air mix cable should be adjusted if the heater valve cable has been disconnected.

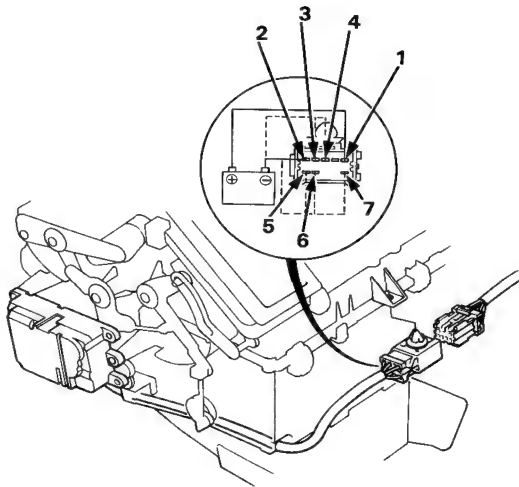


Mode Control Motor

Test

1. Connect the battery positive terminal to the ① terminal of the mode control motor and negative to the ② terminal.
2. Using a jumper wire, short the ② terminal individually to the ③, ④, ⑤, ⑥ and ⑦ terminals, in that order.
 - The motor should run each time the short circuit is made.

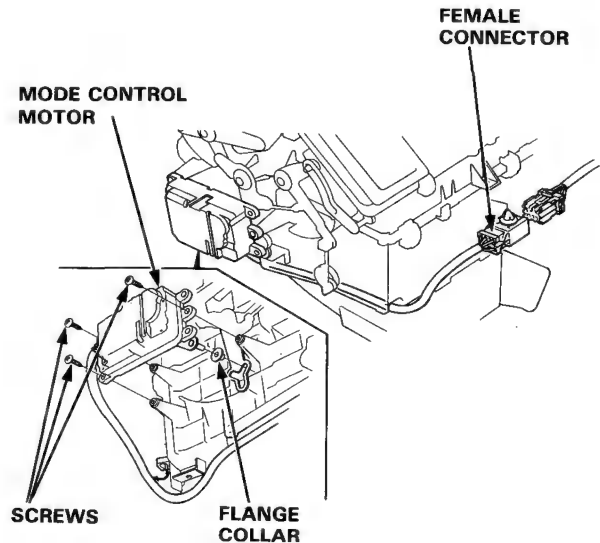
NOTE: If the mode control motor does not run when shorting the first terminal, short that terminal again after shorting the other terminals. The mode control motor is normal if it runs when shorting the first terminal again.



View from wire side

Replacement

1. Disconnect the mode control motor 8P connector and remove the female connector from the stay.
2. Remove the screws (3), mode control motor and flange collar.



3. Installation is the reverse of the removal procedure. After installation, make sure the mode control motor operates smoothly.

Recirculation Control Motor

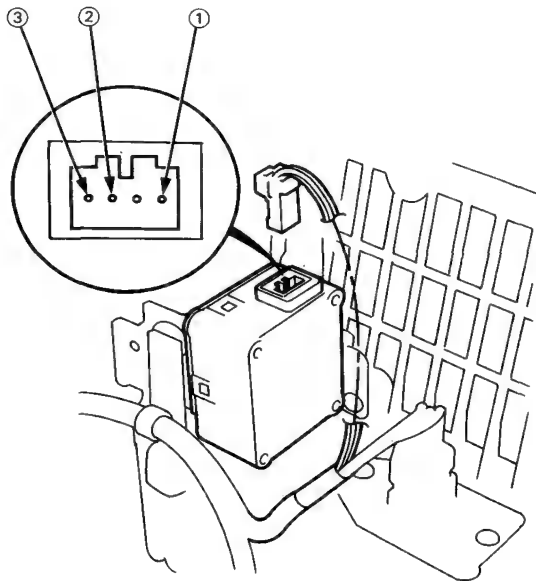
Test

1. Connect the battery positive terminal to the ① terminal of the recirculation control motor connector and negative to the ② and ③ terminals; the recirculation control motor should move smoothly.
2. Disconnect the battery negative terminal from ② or ③; the recirculation control motor should stop at FRESH or REC.

CAUTION: Never connect the battery in the opposite direction.

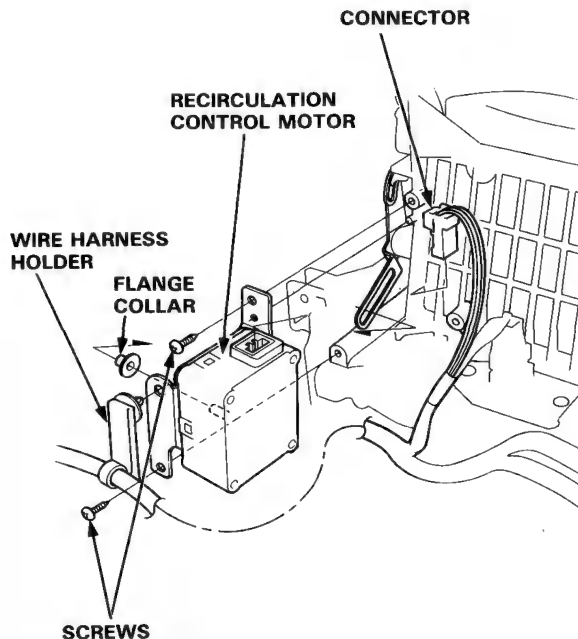
NOTE:

- If the recirculation control motor does not run when shorting the first terminal, short that terminal again after shorting the other terminals. The recirculation control motor is normal if it runs when shorting the first terminal again.
- Don't cycle the recirculation control motor for a long time.
- After adjusting the recirculation control rod, check the recirculation motor on FRESH or REC for two minutes to make sure it operates properly.



Replacement

1. Disconnect the 4P connector from the recirculation control motor and remove the wire harness holder.
2. Remove the screws (3), recirculation control motor and flange collar.



3. Installation is the reverse of the removal procedure. After installation, make sure the recirculation control motor operates smoothly.

Test

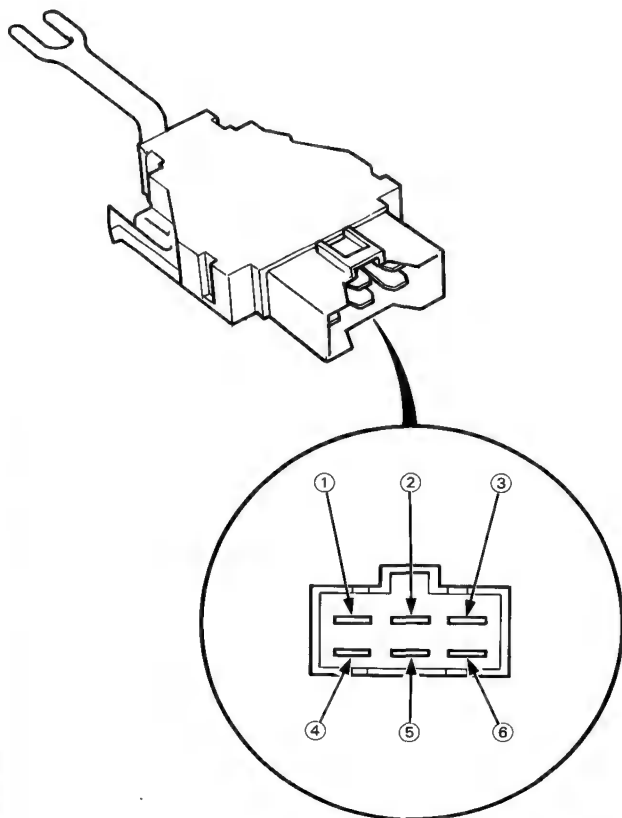


Fan Switch

1. Disconnect the 6P connector from the fan switch.
2. Check for continuity between the terminals of the fan switch according to the table below.

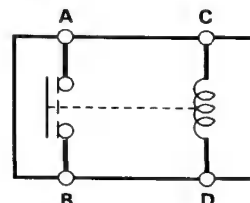
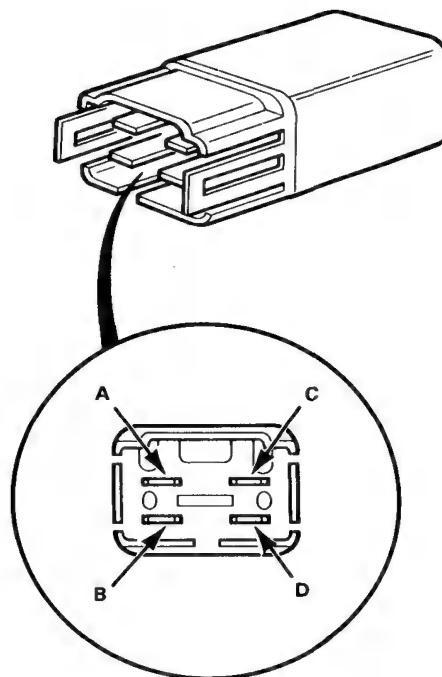
SWITCH CONNECTION

Terminal Position	1	2	3	4	5	6
OFF						
1	○			○		○
2	○	○				○
3	○				○	○
4	○		○			○



Relay

1. Remove the relay from the dash fuse box.
2. There should be continuity between the A and B terminals when the battery is connected to the C and D terminals. There should be no continuity when the battery is disconnected.

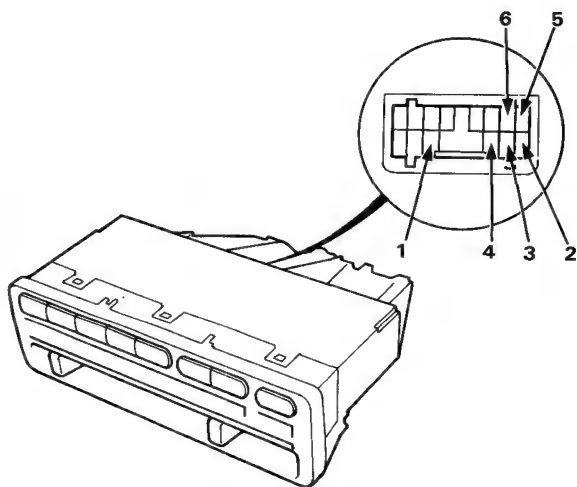


Test

Mode Control Switch

1. Disconnect the 14P connector from the heater control panel.
2. Check for continuity between the terminals of the heater control switch according to the table below.

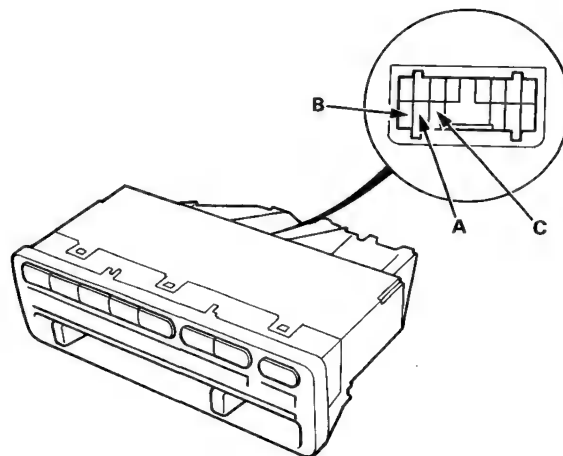
Terminal Position	1	2	3	4	5	6
Heat	○	○				
Heat/Def	○		○			
Def	○			○		
Vent	○				○	
Heat/Vent	○					○



Recirculation Control Switch

1. Disconnect the 14P connector from the heater control panel.
2. Check for continuity between the terminals of the heater control switch according to the table below.

Terminal Position	A	B	C
Fresh		○	○
Rec	○		○



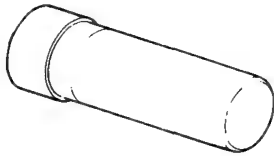
Air Conditioner

Special Tools	22-2	Compressor (Sanden)	
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Replacement	22-35		
Clutch Inspection	22-37		
Clutch Overhaul	22-38		



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	-07746-0030100	Driver Handle C	1	22-30
②	-07HAF-SF10300	Shaft Seal Remover	1	22-32
③	-07HAF-SF10400	Seal Remover/Installer	1	22-32
④	-07LAB-SK70100	A/C Clutch Holder	1	22-38
⑤	07JAC-SH20300	Armature Holder	1	22-44
⑥	07935-8050003	Flywheel Puller	1	22-44
⑦	07945-4150200	Seal Driver	1	22-44
⑧	-07JAC-SH20300	Shaft Ring Remover	1	22-45



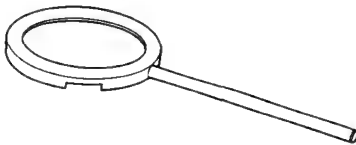
①



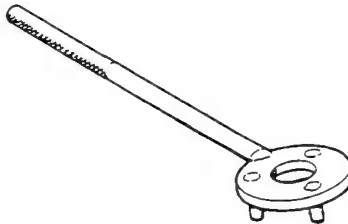
②



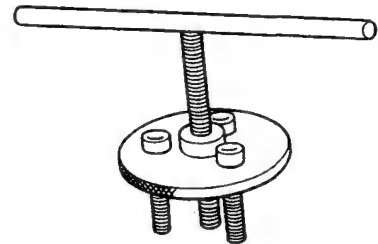
③



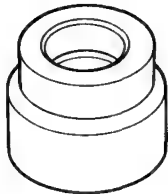
④



⑤



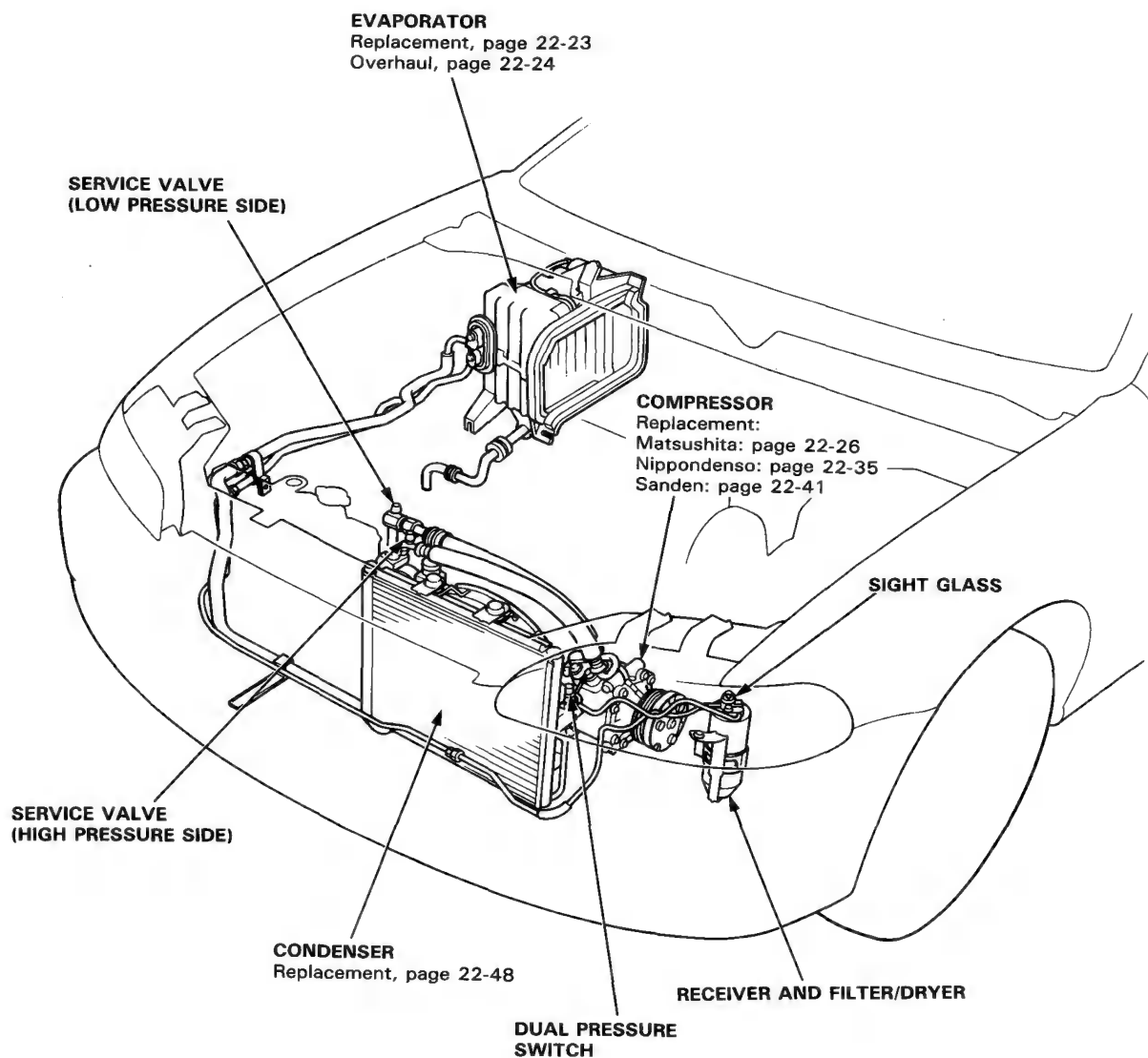
⑥



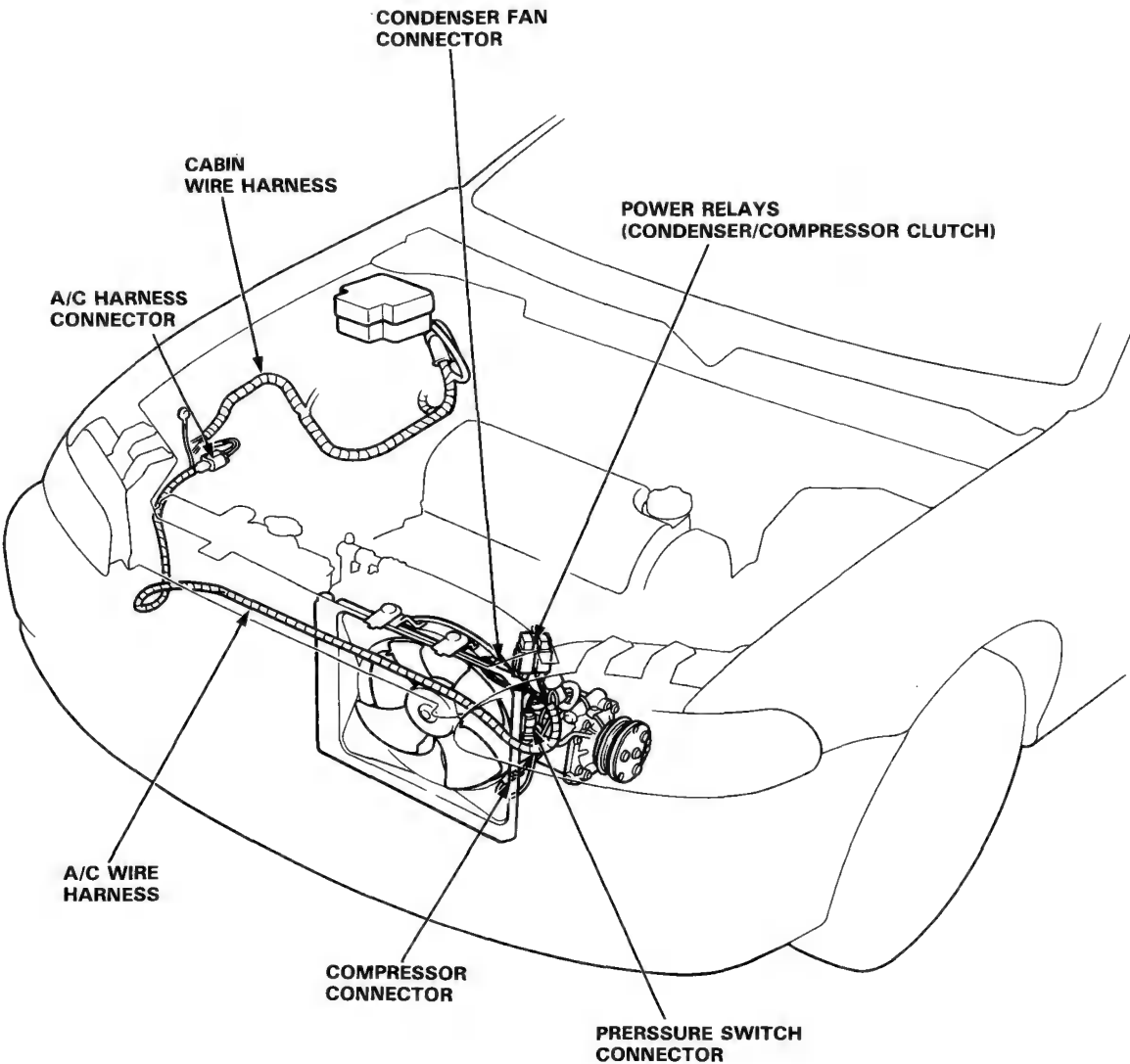
⑦



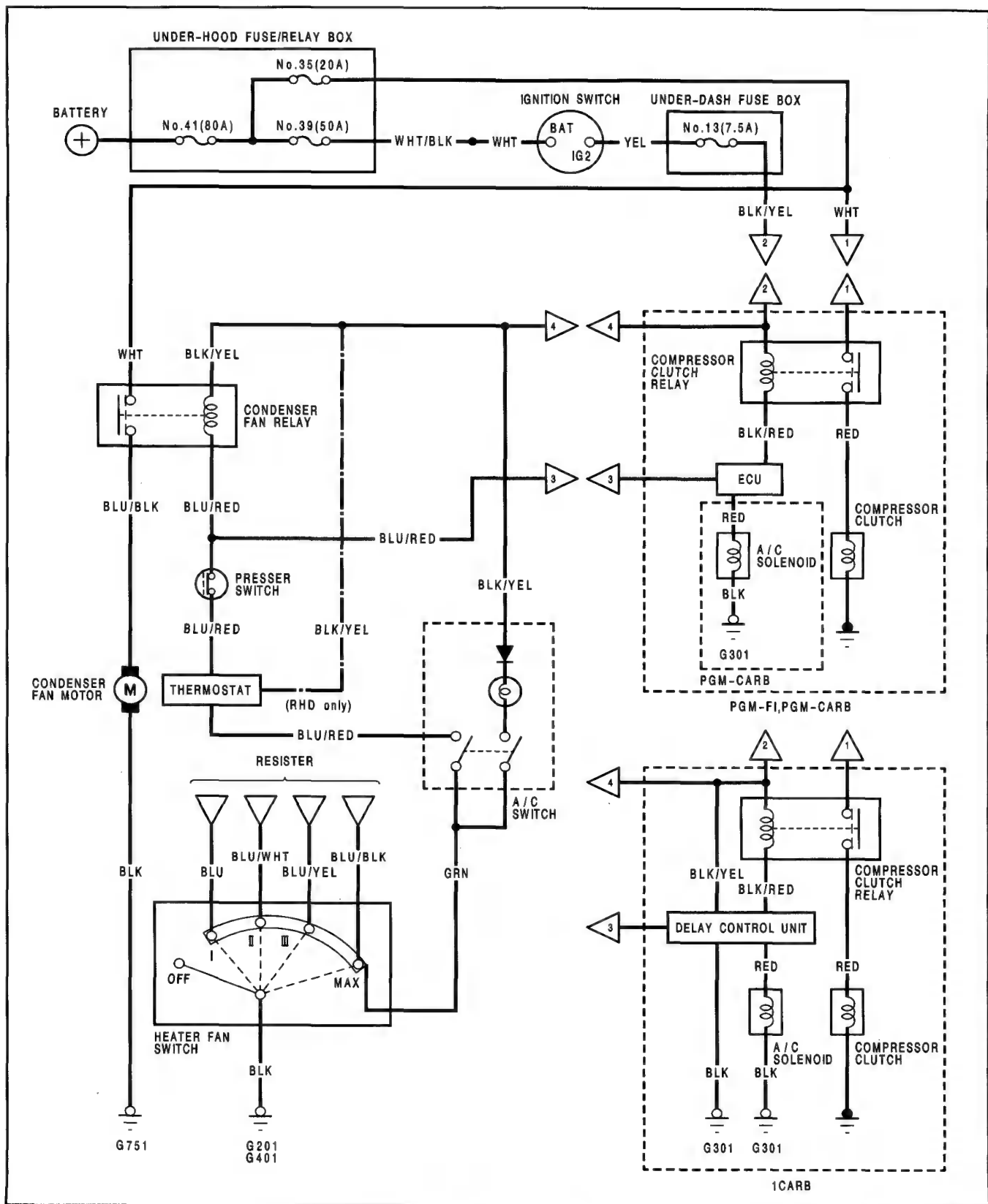
⑧



Wiring/Connector Locations



Circuit Diagram



Troubleshooting

Reference Chart

- Any abnormality must be corrected before continuing the test.
- Because of the precise measurements needed, use a voltmeter and ammeter when testing.

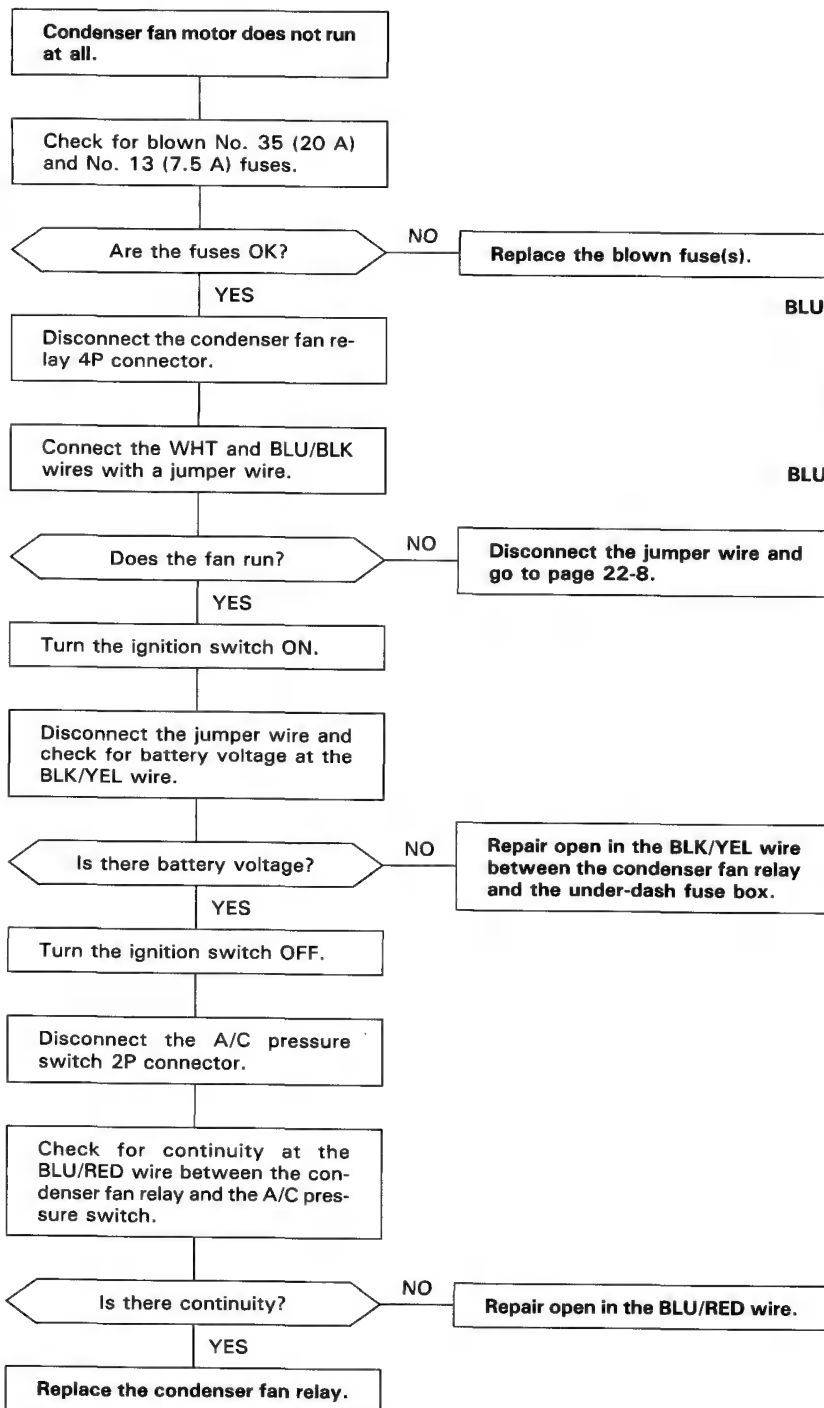
Before performing any troubleshooting procedures check:

- Fuses No. 41 (80 A), No. 39 (50 A), No. 13 (7.5 A), No. 35 (20 A)
- Grounds No. G751, G201, G401
- All connectors are clean and tight.

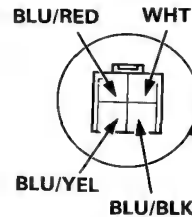
SYMPTOM	REMEDY
Condenser fan does not run at all.	Perform the procedures in the flowchart. (page 22-7)
Compressor clutch does not engage.	Perform the procedures in the flowchart. (page 22-9)
A/C system does not come on.	Perform the procedures in the flowchart. (page 22-13)



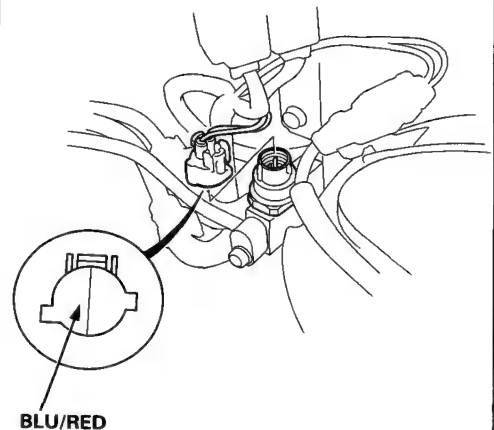
Condenser Fan



View from terminal side



View from terminal side



(cont'd)

Troubleshooting

Condenser Fan (cont'd)

From page 22-7

Measure voltage between the WHT wire terminal (+) and body ground (-) at the condenser fan relay 4P connector.

Is there battery voltage?

NO

Repair open in the WHT wire between the under-hood fuse/relay box and condenser fan relay.

YES

Disconnect the 2P connector at the condenser fan.

Check for continuity in the BLU/BLK wire between the condenser fan relay and fan.

Is there continuity?

NO

Repair open in the BLU/BLK wire between the condenser fan relay and condenser fan.

YES

Test the condenser fan motor. Connect a 12 V battery positive (+) lead to the BLU/BLK wire terminal, and the negative (-) lead to the BLK wire terminal.

Does the condenser fan motor run?

NO

Replace the condenser fan motor.

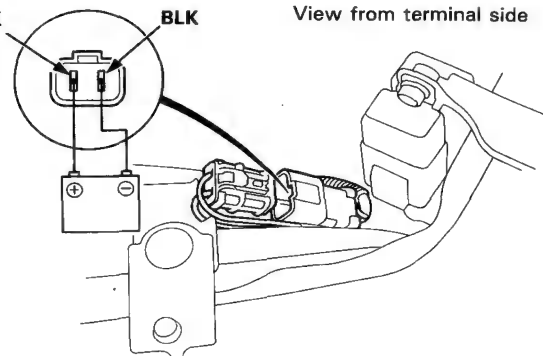
YES

Repair open in the BLK wire between the condenser fan motor and body ground. If the wire is OK, check for poor ground at G751.

BLU/BLK

BLK

View from terminal side





Compressor

Compressor clutch does not engage.

Check for blown fuses No. 13 (7.5 A) and No. 35 (20 A).

Are the fuses OK?

NO

Replace the fuse(s).

YES

RH type: go to



LH type

Disconnect the A/C thermo switch 2P connector.

Turn the ignition switch, A/C switch and heater fan switch ON.

Connect a jumper wire across the A/C thermostat 2P connector.

Does the compressor engage?

YES

Replace the A/C thermo switch.

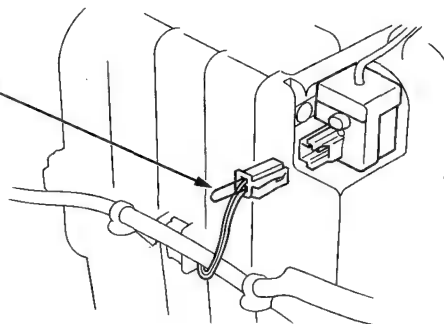
NO

Reconnect the A/C thermo switch 2P connector.

To page 22-10



JUMPER WIRE



RH type

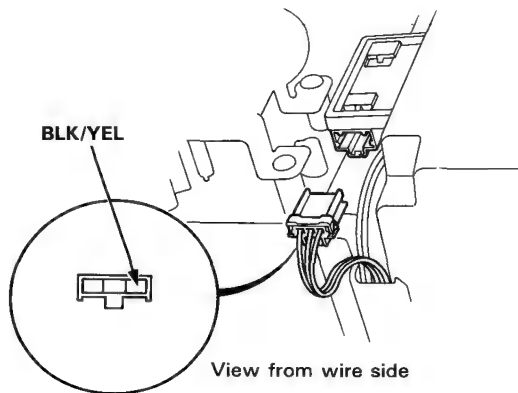


Disconnect the A/C thermo switch 3P connector.

Turn the ignition switch ON.

Measure voltage between BLK/YEL wire terminal (+) and body ground (-).

BLK/YEL



View from wire side

To page 22-10

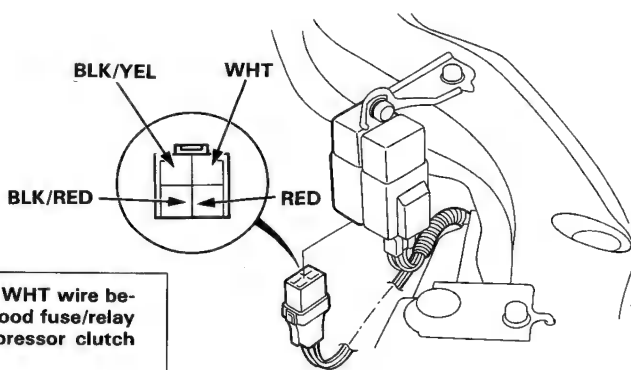
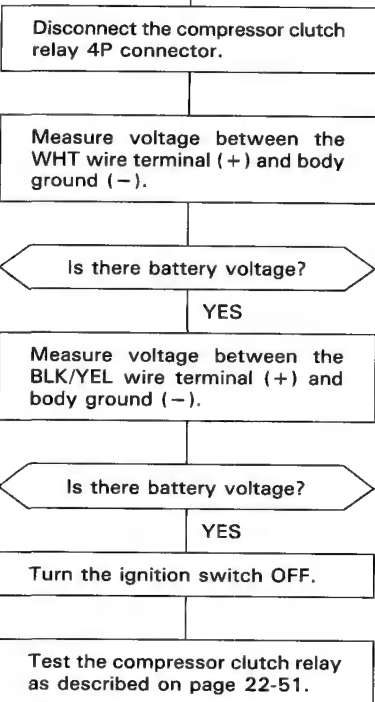
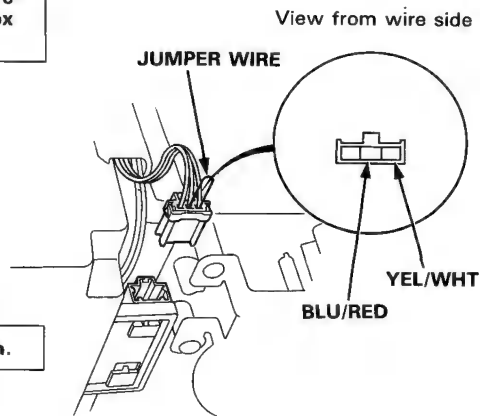
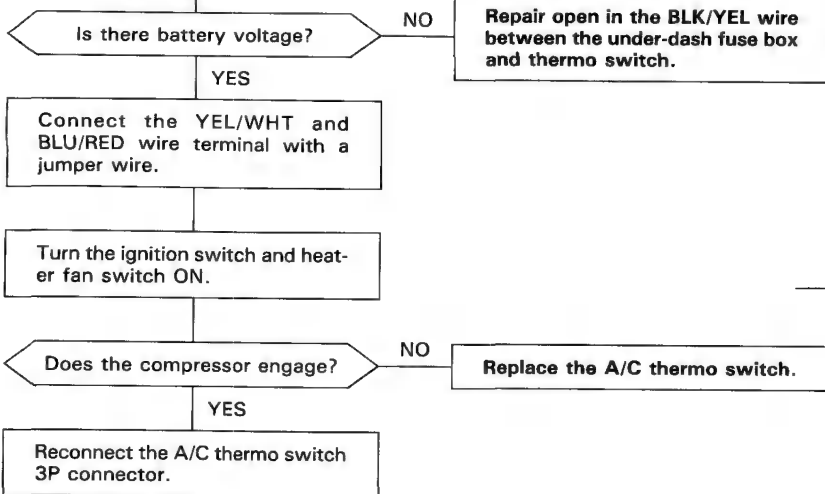
(cont'd)

Troubleshooting

Compressor (cont'd)

From page 22-9

RH type



To page 22-11



From page 22-10

Is the compressor clutch relay OK? NO **Replace the compressor clutch relay.**

YES

Disconnect the compressor clutch 1P connector.

Check for continuity in the RED wire between the compressor clutch relay and compressor clutch.

Is there continuity? NO **Repair open in the RED wire between the compressor clutch relay and compressor clutch.**

YES

Check the clearance between the clutch pulley and pressure plate:
Matsushita (page 22-28)
Nippondenso (page 22-37)
Sanden (page 22-43)

Is the clearance OK? NO **Adjust the clearance:
Matsushita (page 22-28)
Nippondenso (page 22-37)
Sanden (page 22-43)**

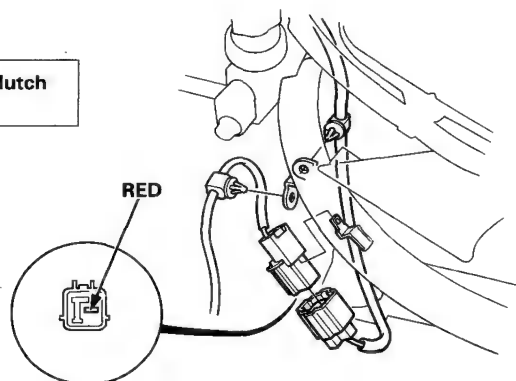
YES

Test the compressor clutch field coil:
Matsushita (page 22-27)
Nippondenso (page 22-37)
Sanden (page 22-43)

Is the compressor clutch field coil OK? NO **Replace the compressor clutch field coil:
Matsushita (page 22-28)
Nippondenso (page 22-38)
Sanden (page 22-44)**

YES

PGM F-I, PGM CAB Engine:
to page 22-12
Carbureted Engine:
to page 22-13



(cont'd)

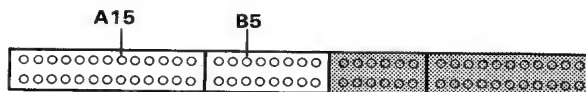
Troubleshooting

Compressor (cont'd)

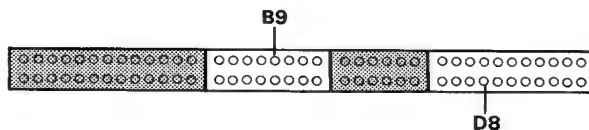
PGM F-I, PGM CARB Engine:

From page 22-11

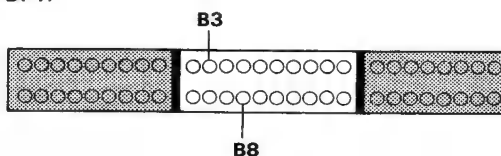
PGM-FI:



PGM-CARB:



DP1:



TEST HARNESS

Reconnect the A/C compressor clutch relay.

Connect the ECU test harness "A", "B" and "D" connectors to the wire harness only, not the ECU (section 11).

Turn the ignition switch ON.

Measure voltage between the A15, B9 or B3 terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/RED wire between the compressor clutch relay and ECU.

YES

Turn the A/C switch OFF.

Measure voltage between the B5, D8 or B8 test harness terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLU/RED wire between the condenser fan relay and ECU.

YES

Substitute a known-good ECU and recheck. If symptom/indication goes away, replace original ECU.



Carburated Engine:

From page 22-11

Disconnect the 6P connector from the delay control unit and the 4P connector from the condenser fan relay.

Check for continuity in the BLU/RED wire between the condenser fan relay and delay control unit.

Is there continuity?

NO

Repair open in the BLU/RED wire between the condenser fan relay and delay control unit.

YES

Turn the ignition switch ON.

Measure voltage between the BLK/YEL wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/YEL wire between the No. 13 (7.5 A) fuse and delay control unit.

YES

Turn the ignition switch OFF.

Check for continuity in the BLK wire between the delay control unit and body ground.

Is there continuity?

NO

Repair open in the BLK wire between the delay control unit and body ground. If the wire is OK, check for proper ground at G301.

YES

Check for continuity in the BLK/RED wire between the compressor clutch relay and delay control unit.

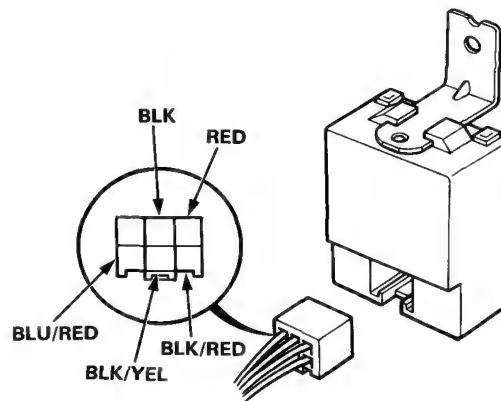
Is there continuity?

NO

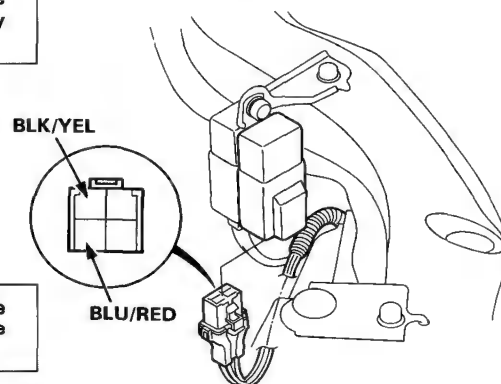
Repair open in the BLK/RED wire between the compressor clutch relay and delay control unit.

YES

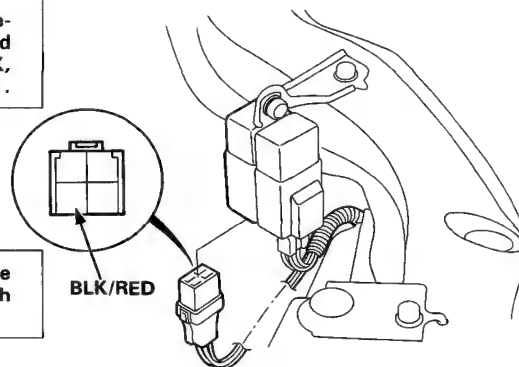
Replace the delay control unit.



View from wire side



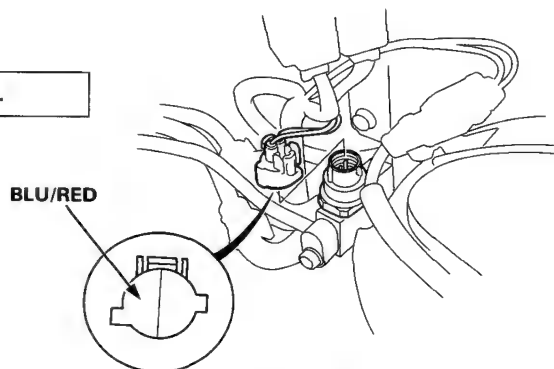
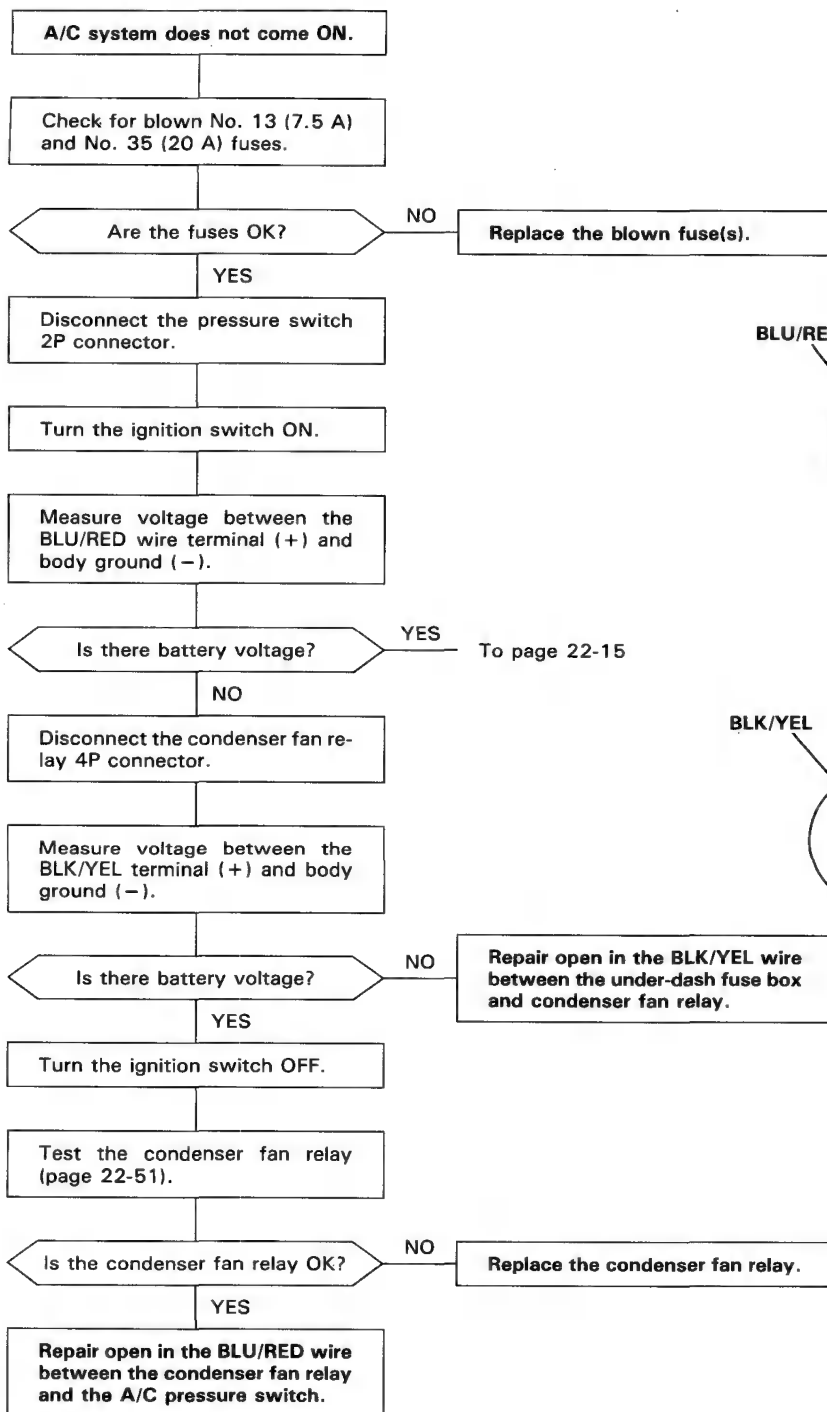
View from wire side



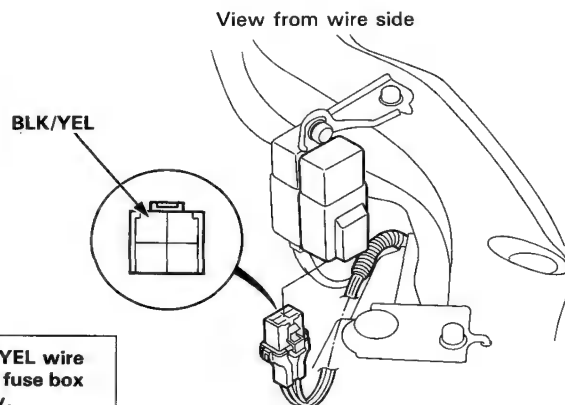
View from wire side

Troubleshooting

A/C System



View from terminal side



View from wire side



From page 22-14

Turn the ignition switch OFF.

Check for continuity between No. 1 and No. 2 terminals of the A/C pressure switch.

Is there continuity?

NO

Check for refrigerant pressure.

Is refrigerant pressure OK?

NO

Perform leak test (page 22-50).

YES

Replace the pressure switch.

YES

B RH type:
Page 22-16

LH type

Reconnect the pressure switch 2P connector.

Disconnect the thermo switch 2P connector.

Turn the ignition switch ON.

Measure voltage between the YEL/WHT wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the YEL/WHT wire between the pressure switch and thermo switch.

YES

Turn the ignition switch OFF.

Test the thermo switch (page 22-51).

Is the thermo switch OK?

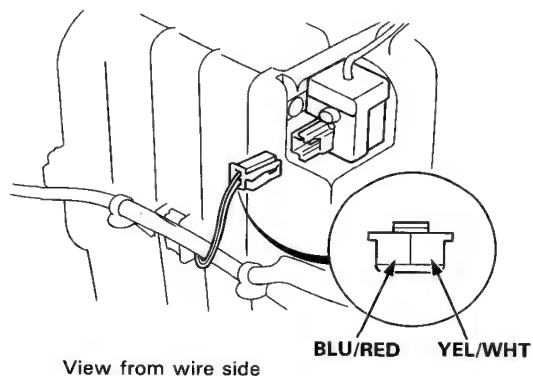
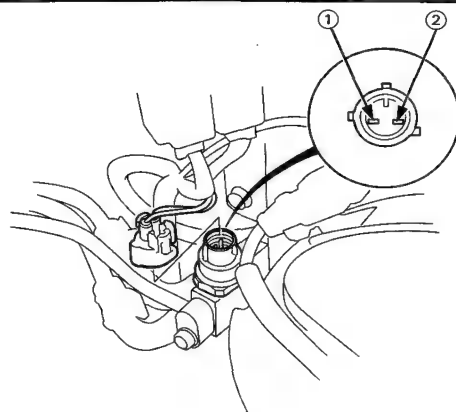
NO

Replace the thermo switch.

YES

A

To page 21-16



(cont'd)

Troubleshooting

A/C System (cont'd)

From page 22-15

RH type

Reconnect the pressure switch 2P connector.

Disconnect the thermo switch 3P connector.

Turn the ignition switch ON.

Measure voltage between the BLK/YEL wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/YEL wire between the under-dash fuse box and thermo switch.

YES

Measure voltage between the YEL/WHT wire terminal and body ground.

Is there battery voltage?

NO

Repair open in the YEL/WHT wire between the pressure switch and thermo switch.

YES

Reconnect the thermo switch 3P connector and connect the BLU/RED wire terminal to ground with a jumper wire.

Does the condenser fan run and the compressor clutch engage?

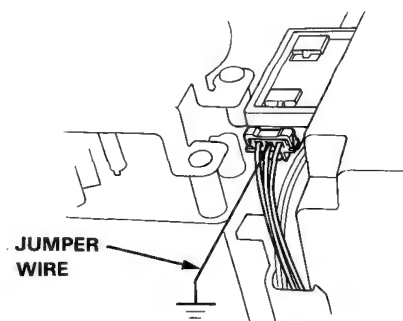
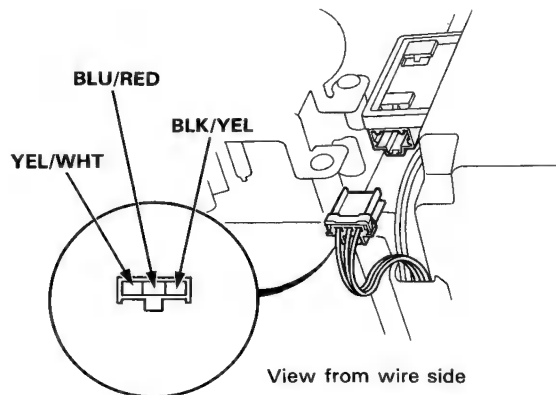
NO

Replace the thermo switch.

YES

Remove the heater control panel (page 21-16) and disconnect the 14P connector.

To page 21-17





From page 22-16

Check for continuity in the BLU/
RED wire between the thermo
switch and heater control panel.

Is there continuity?

NO

Repair open in the BLU/RED wire
between the thermo switch and
heater control panel.

YES

Disconnect the heater fan switch
6P connector.

Check for continuity in the GRN
wire between the heater control
panel 14P connector and heater
fan switch 6P connector.

Is there continuity?

NO

Repair open in the GRN wire be-
tween the heater control panel
and heater fan switch.

YES

Check for continuity at the BLK
wire between the heater fan
switch 6P connector and body
ground.

Is there continuity?

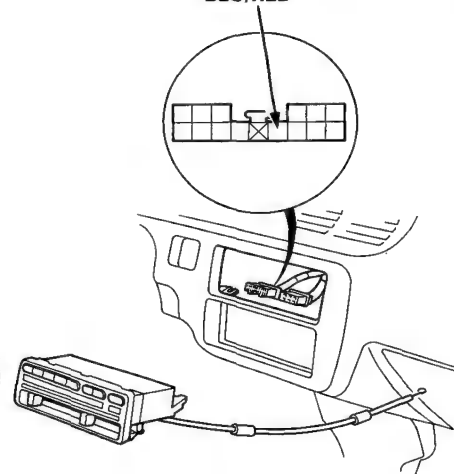
NO

Repair open in the BLK wire be-
tween the heater fan switch and
ground.
If the wire is OK, check for proper
ground at G201, 401.

YES

Replace the heater control panel.

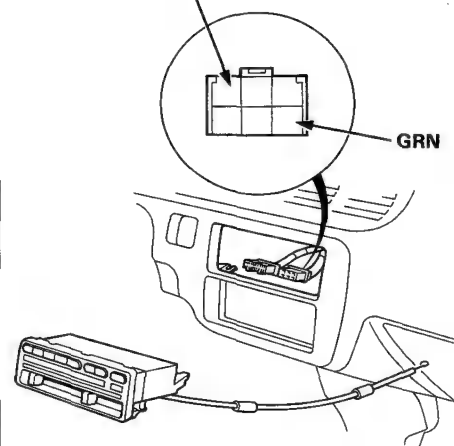
BLU/RED



View from wire side

BLK

GRN



View from wire side

A/C Service Tips and Precautions

⚠ WARNING When handling refrigerant (R-12):

- Always wear eye protection.
- Do not let refrigerant get on your skin or your eyes; if it does:
 - Do not rub your eyes or skin.
 - Splash large quantities of cool water in your eyes or on your skin.
 - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (cans of R-12) stored below 40°C (100°F).
- Do not handle or discharge refrigerant in an enclosed area near an open flame; it may ignite and produce poisonous gas.
- Chlorine from chemicals called chlorofluorocarbons (CFCs) destroy the ozone in the stratosphere. Automotive air conditioning systems currently use chlorofluorocarbons as the refrigerant. Auto air conditioning service equipment has been developed to minimize the release of CFCs to the atmosphere. All service procedures should be performed using this equipment and the manufacturer's instructions.

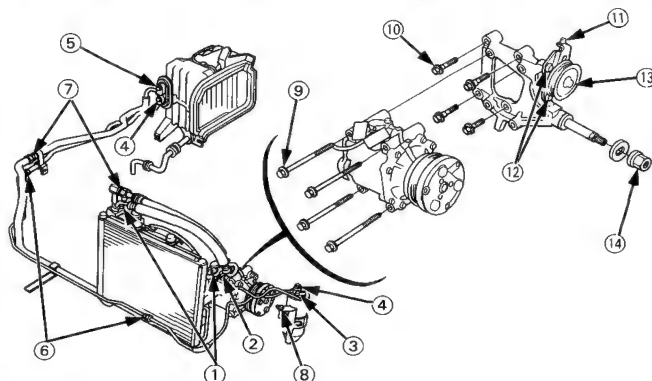
1. Always disconnect the negative cable from the battery whenever replacing air conditioner parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before the lines are reconnected.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the seat of the O-ring or flare nut.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, use a refrigerant recovery system; don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts;

	Matsushita	Nippondenso	Sanden
Condenser	15 cc (1/2 fl oz)	15 cc (1/2 fl oz)	20 cc (2/3 fl oz)
Evaporator	35 cc (1-1/6 fl oz)	35 cc (1-1/6 fl oz)	45 cc (1-1/2 fl oz)
Line or Hose	10 cc (1/3 fl oz)	10 cc (1/3 fl oz)	10 cc (1/3 fl oz)
Receiver	10 cc (1/3 fl oz)	10 cc (1/3 fl oz)	10 cc (1/3 fl oz)

Compressor On compressor replacement, subtract the volume of oil drained from the removed compressor from A, and drain the calculated volume of oil from the new compressor.

A – Volume of removed compressor = Draining volume

A: Matsushita: 140 cc (4-2/3 fl oz), Nippondenso: 80 cc (2-2/3 fl oz), Sanden: 120 cc (4 fl oz)



① Discharge hose bolts (8 x 1.25)	22 N·m (2.2 kg-m, 16 lb-ft)
② Suction hose bolt (8 x 1.25)	22 N·m (2.2 kg-m, 16 lb-ft)
③ Condenser pipe bolts (6 x 1.0)	10 N·m (1.0 kg-m, 7 lb-ft)
④ Receiver pipe bolts (6 x 1.0)	10 N·m (1.0 kg-m, 7 lb-ft)
⑤ Suction pipe bolt (8 x 1.25)	22 N·m (2.2 kg-m, 16 lb-ft)
⑥ Receiver pipe joint nuts	14 N·m (1.4 kg-m, 10 lb-ft)
⑦ Suction pipe joint nuts	33 N·m (3.3 kg-m, 24 lb-ft)
⑧ Receiver/dryer bolts (6 x 1.0)	10 N·m (1.0 kg-m, 7 lb-ft)
⑨ Compressor mounting bolts	25 N·m (2.5 kg-m, 18 lb-ft)
⑩ Compressor bracket mounting bolts	48 N·m (4.8 kg-m, 35 lb-ft)
⑪ Adjusting bolt	8 N·m (0.8 kg-m, 5.8 lb-ft)
⑫ Idler pulley bracket bolts	25 N·m (2.5 kg-m, 18 lb-ft)
⑬ Idler pulley center nut	48 N·m (4.8 kg-m, 35 lb-ft)
⑭ Engine mount bracket nut	70 N·m (7.0 kg-m, 50 lb-ft)



A/C System Service

A/C System Discharge

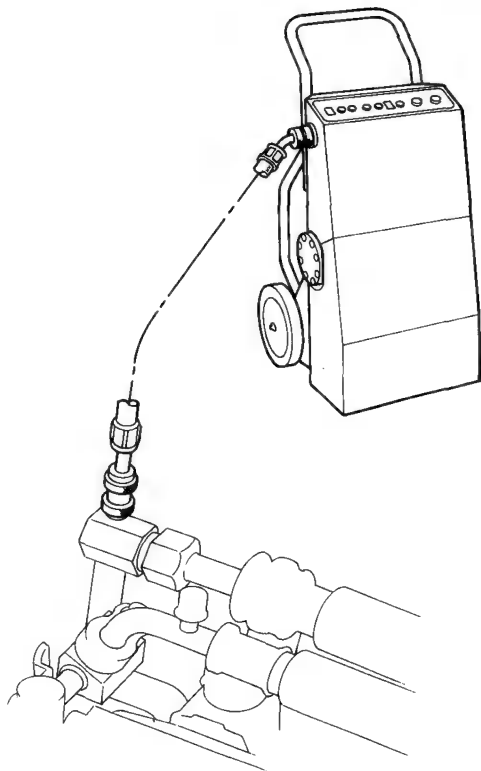
▲ WARNING

- Keep away from open flames. The refrigerant, although nonflammable, will produce a poisonous gas if burned.
- Work in a well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small enclosed area.

1. Connect a Refrigerant Recovery System to the A/C system.
2. Operate the Refrigerant Recovery System according to the manufacturer's instructions.

IMPORTANT: Do not vent refrigerant to the atmosphere. The chlorofluorocarbons (CFCs) used in conventional refrigerant (R-12) may damage the earth's ozone layer. Always use UL-listed, refrigerant recovery/recycling equipment to extract the refrigerant before you open an A/C system to make repairs. Follow the equipment manufacturer's instructions.

REFRIGERANT RECOVERY/
RECYCLING SYSTEM



A/C System Service

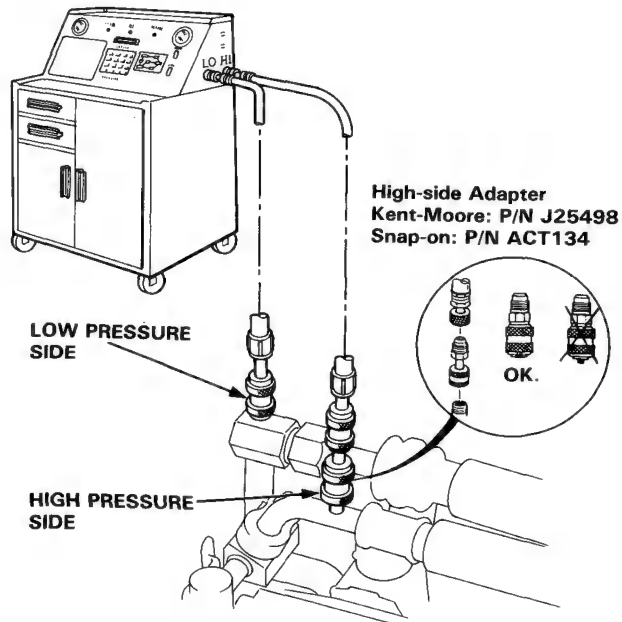
Performance Test

The performance test will help to determine if the air conditioning system is operating within specifications.

1. Connect the Air Conditioning Service Station as shown.

NOTE: Connect the adapter to the high pressure hose first, then connect the hoses to the car as shown. When testing is completed, disconnect the hose adapter from the high-side fitting; do not disconnect the hose from the adapter, or refrigerant may escape from the system.

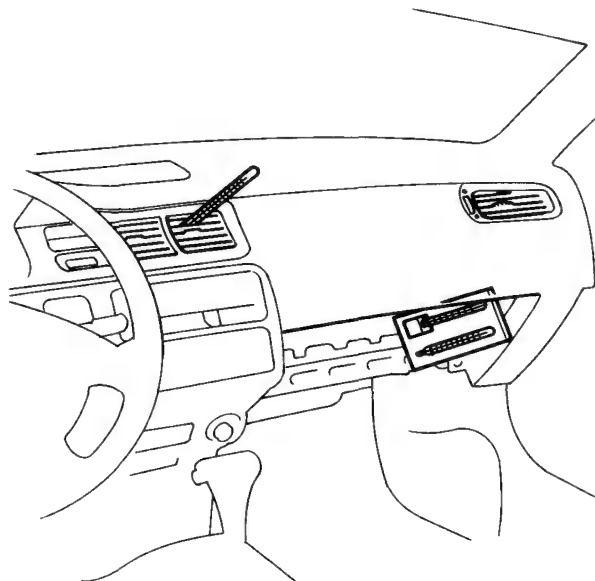
AIR CONDITIONING SERVICE STATION



LOW PRESSURE SIDE

HIGH PRESSURE SIDE

3. Test conditions:
 - Avoid direct sunlight.
 - Open engine hood.
 - Open front doors.
 - Set the temperature control dial to COLD and push the mode control button to VENT position and recirculation control button to REC position.
 - Slide the fan switch to the highest position.
 - Run the engine at 1,500 rpm.
 - No driver or passengers in vehicle.
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent and the high and low system pressure from the Air Conditioning Service Station.

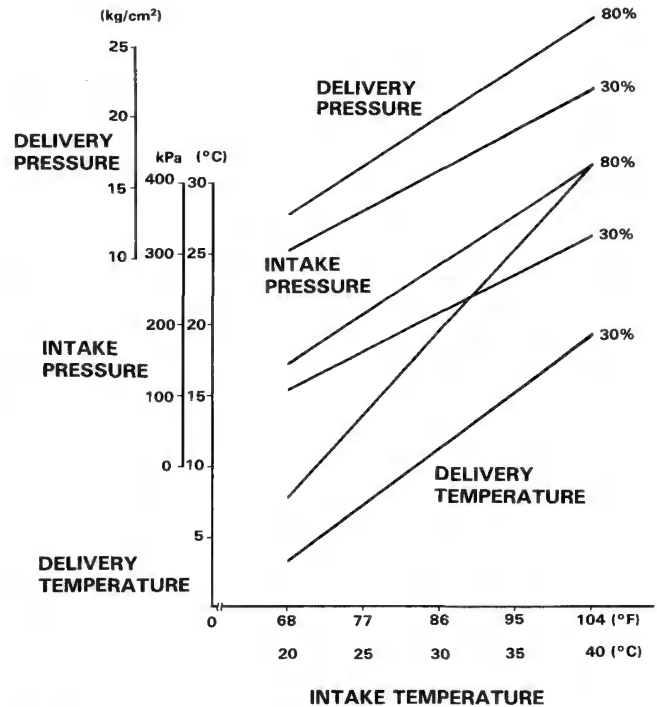




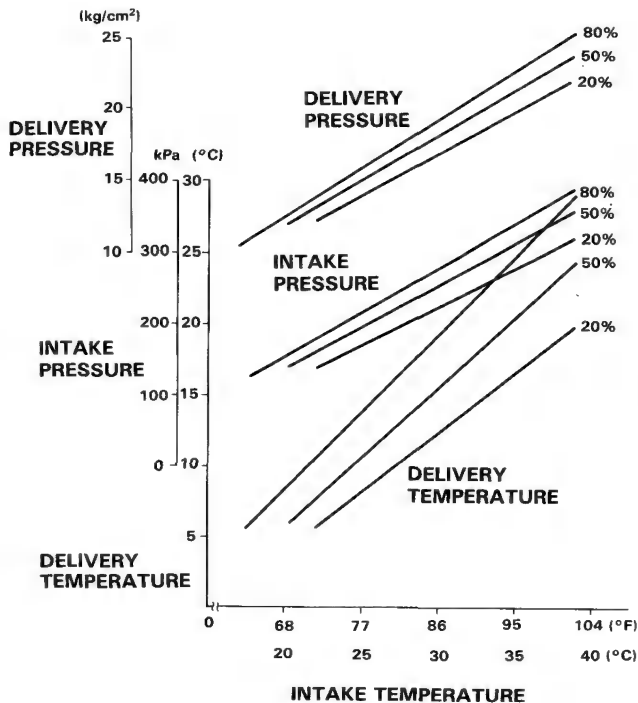
5. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point one line above and one line below the humidity level. (10% above and 10% below the humidity level)
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low side pressure test and high side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.

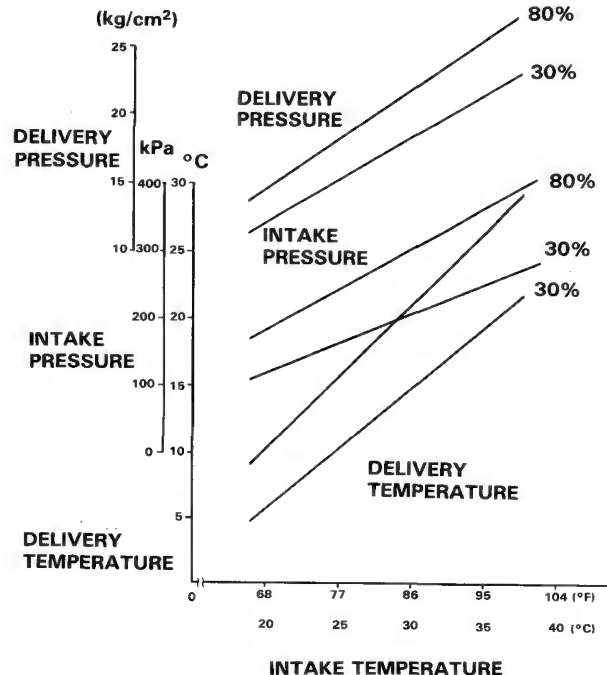
Sanden:



Nippondenso:



Matsushita:



A/C System Service

Pressure Test Chart

TEST RESULTS	RELATED SYMPTOMS	PROBABLE CAUSE	REMEDY
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 196 kPa (28 psi) quickly, and then falls gradually	Air in system	Evacuate system: then recharge Evacuation: page 22-48 Recharging: page 22-49
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge refrigerant as necessary
	Reduced or no air flow through condenser	<ul style="list-style-type: none"> • Clogged condenser or radiator fins • Condenser or radiator fan not working properly 	<ul style="list-style-type: none"> • Clean • Check voltage and fan rpm • Check fan direction
	Line to condenser is excessively hot	Restricted flow of refrigerant in system	<ul style="list-style-type: none"> • Expansion valve • Restricted lines
Discharge pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot	Insufficient refrigerant in system	<ul style="list-style-type: none"> • Check for leak • Charge system
	High and low pressures are balanced soon after stopping compressor	<ul style="list-style-type: none"> • Faulty compressor discharge or inlet valve • Faulty compressor seal 	Replace
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum	<ul style="list-style-type: none"> • Faulty expansion valve • Moisture in system 	<ul style="list-style-type: none"> • Replace • Flush and evacuate
Suction (low) pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot	Insufficient refrigerant	Check for leaks. Charge as required.
	Expansion valve is not frosted and low pressure line is not cold. Low pressure gauge indicates vacuum	<ul style="list-style-type: none"> • Frozen expansion valve • Faulty expansion valve 	Replace expansion valve
	Discharge temperature is low and the air flow from vents is restricted	Frozen evaporator	Run the fan with compressor off then check capillary tube.
	Expansion valve frosted	Clogged expansion valve	Clean or Replace
	Receiver dryer is cool (should be warm during operation)	Clogged receiver dryer	Replace
Suction pressure abnormally high	Low pressure hose and check joint are cooler than around evaporator	<ul style="list-style-type: none"> • Expansion valve open too long • Loose expansion valve 	Repair or Replace.
	Suction pressure is lowered when condenser is cooled by water	Excessive refrigerant in system	Discharge refrigerant as necessary
	High and low pressure are equalized as soon as the compressor is stopped and both gauges fluctuate while running	<ul style="list-style-type: none"> • Faulty gasket • Faulty high pressure valve • Foreign particle stuck in high pressure valve 	Replace compressor
Suction and discharge pressures abnormally high	Reduced air flow through condenser	<ul style="list-style-type: none"> • Clogged condenser or radiator fins • Condenser or radiator fan not working properly 	<ul style="list-style-type: none"> • Clean condenser and radiator • Check voltage and fan rpm • Check fan direction
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Evacuate and recharge
Suction and discharge pressure abnormally low	Low pressure hose and metal end areas are cooler than evaporator	Clogged or kinked low pressure hose parts	Repair or Replace
	Temperature around expansion valve is too low compared with that around receiver dryer	Clogged high pressure line	Repair or Replace
Refrigerant leaks	Compressor clutch is dirty	Compressor shaft seal leaking	Replace compressor
	Compressor bolt(s) are dirty	Leaking around bolt(s)	Tighten bolt(s) or replace compressor
	Compressor gasket is wet with oil	Gasket leaking	Replace compressor
Compressor heat damage	Black soot inside compressor and hoses.	Restriction or leak in system.	Flush entire system, replace rubber lines or hoses.

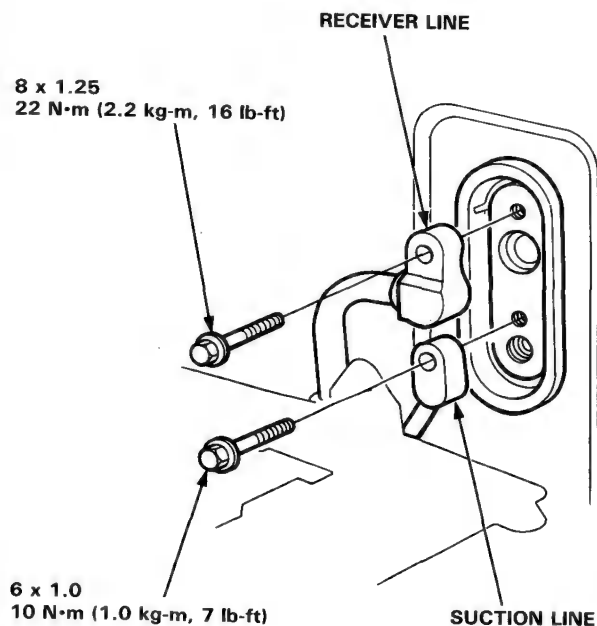
Evaporator

Replacement

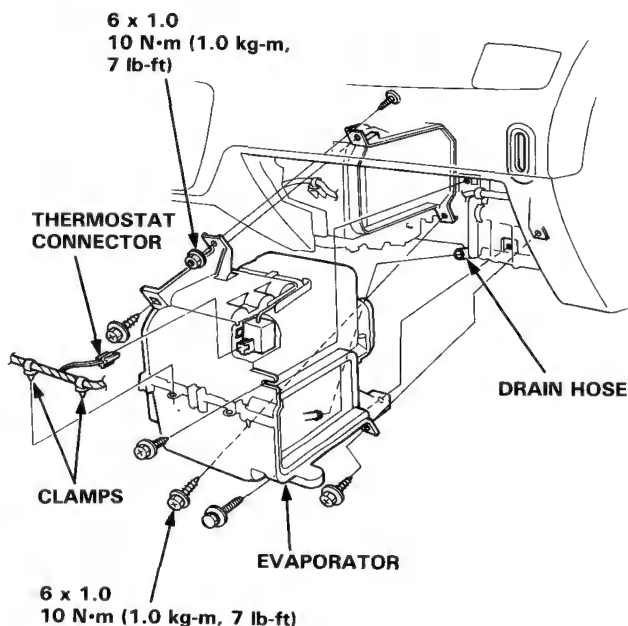


1. Disconnect the battery negative terminal first then the positive cable.
Remove the battery.
2. Discharge the refrigerant (page 22-19).
3. Remove the bolts and disconnect the receiver line and suction line from the evaporator.

CAUTION: Cap the open fittings immediately to keep moisture out of the system.



4. Remove the glove box and glove box frame (Section 20).
5. Disconnect the connector from the A/C thermostat and pull off the clamps from the evaporator.
6. Remove the self-tapping screws (4), bolt and nut.
7. Disconnect the drain hose and remove the evaporator.



8. Install in the reverse order of removal, and:
 - Apply a sealant to the grommets.
 - Make sure that there is no air leakage.
 - Charge the system (page 22-49) and test performance (page 22-20).

Evaporator

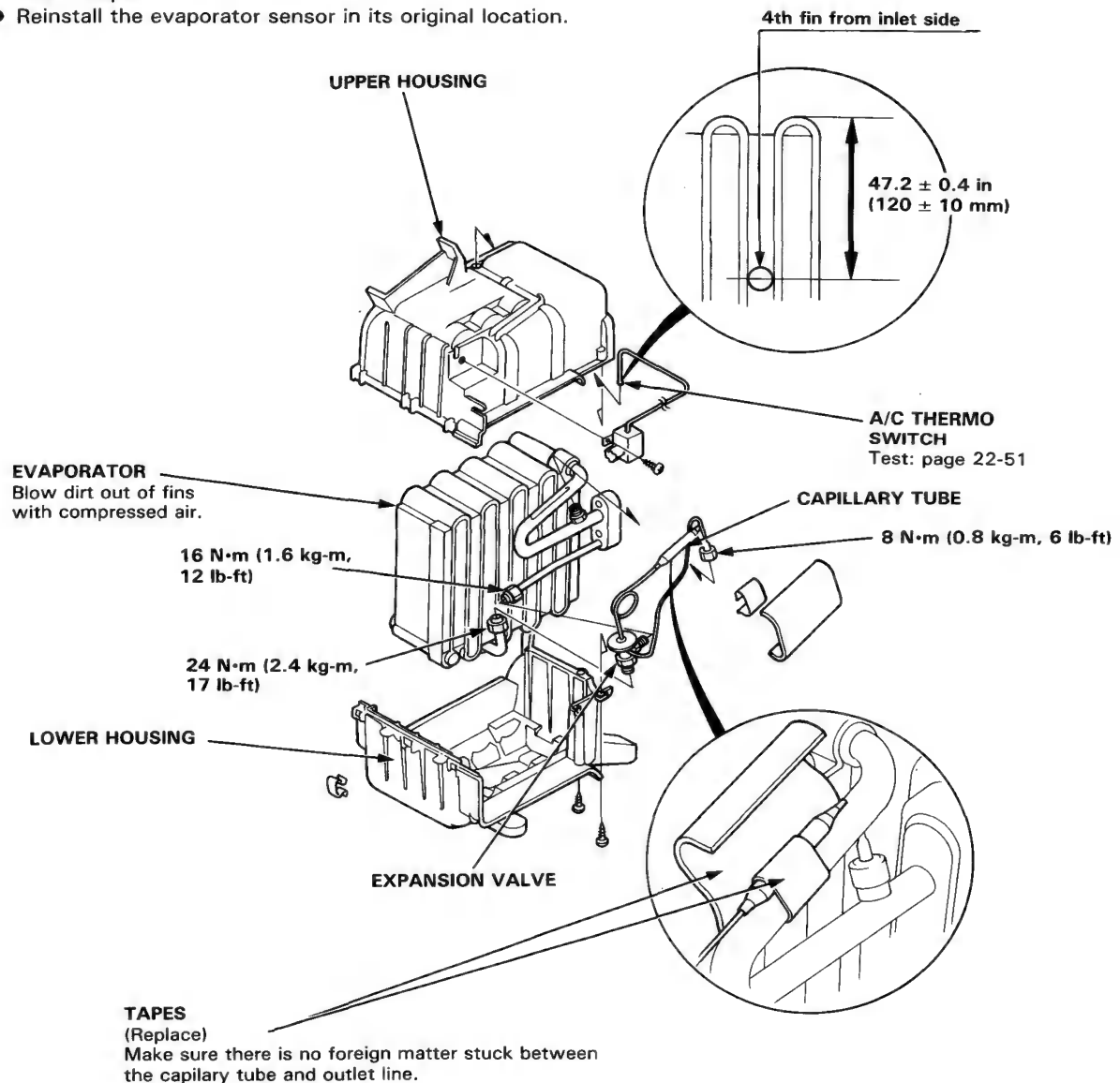
Overhaul

1. Pull the evaporator sensor out of the evaporator fins.
2. Remove the self-tapping screws and clips from the housing.
3. Carefully separate the housings and remove the evaporator covers.
4. Remove the expansion valve if necessary.

NOTE: When loosening the expansion valve nuts, use a second wrench to hold the valve or evaporator pipe or they can be cracked.

Assemble the evaporator in the reverse order of disassembly, and:

- Apply a thin coat of refrigerant oil to the new O-rings at joint nuts.
- Install the expansion valve capillary tube with the capillary tube in contact with the suction line directly, and wrap it with tape.
- Reinstall the evaporator sensor in its original location.

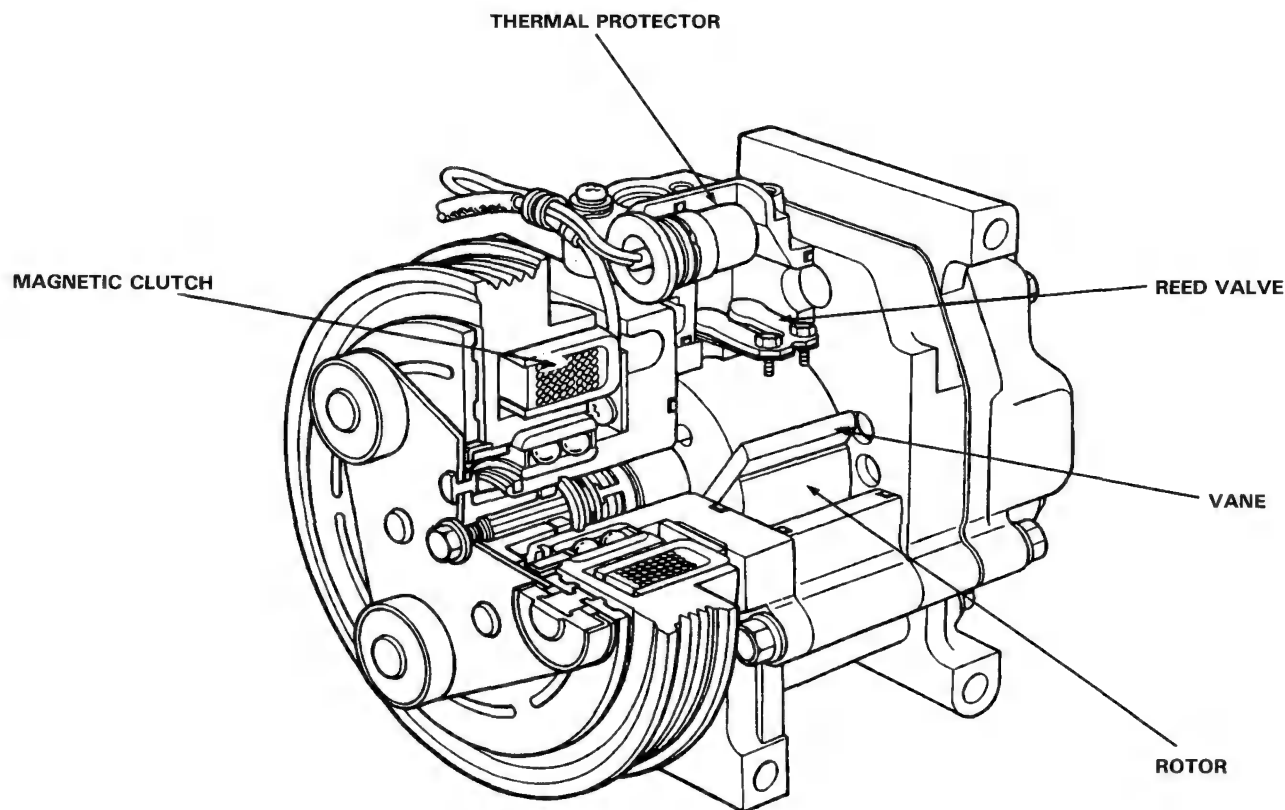


Compressor (Matsushita)



Description

This compressor is a three-vane, rotary type and consists of three vanes that comes out of the rotor to the cylinder wall, reed valve that prevents backflow, and magnetic clutch. A thermal protector is installed on this compressor.



Compressor (Matsushita)

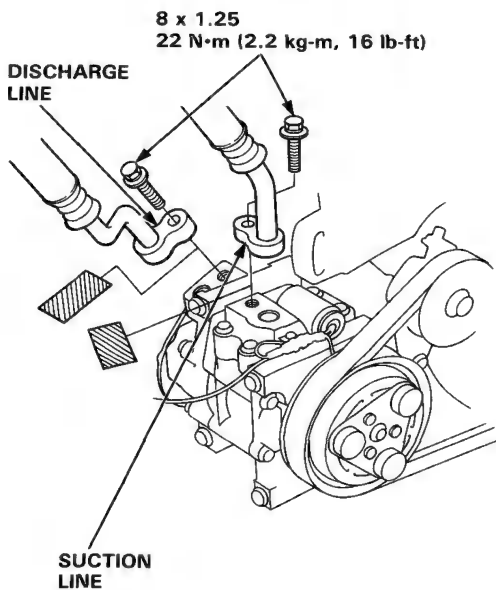
Replacement

1. If the compressor is marginally operable, run the engine at idle speed and turn the air conditioner fan for a few minutes, then shut the engine off and disconnect the battery negative terminal.

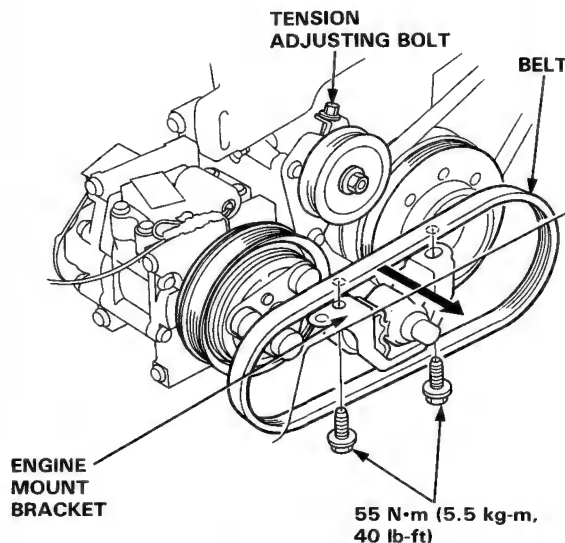
NOTE: Before removing the compressor, clean dirt off the engine.

2. Discharge the refrigerant from the system (page 22-19).
3. Remove the power steering pump (Section 17).
4. Remove the bolts (2) and disconnect the suction line and discharge line from the compressor.

CAUTION: Cap the open fittings immediately to keep moisture out of the system.

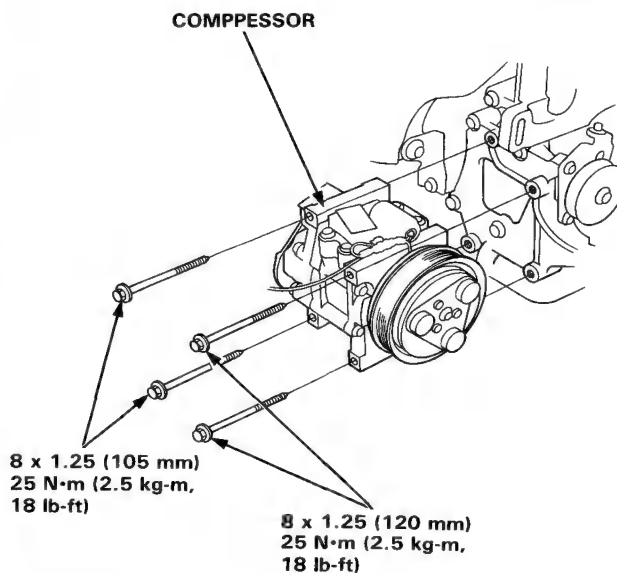


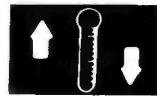
5. Loosen the compressor belt tension adjusting bolt and remove the belt from the pulleys. Remove the left engine mount bracket bolts (2) and pass the belt through the gap between the body and left engine mount bracket.



6. Disconnect the compressor clutch 1P connector. Remove the compressor mounting bolts (4) and compressor.

NOTE: The compressor mounting bolts are different in length, therefore be careful not to interchange the longer ones and shorter when installing.



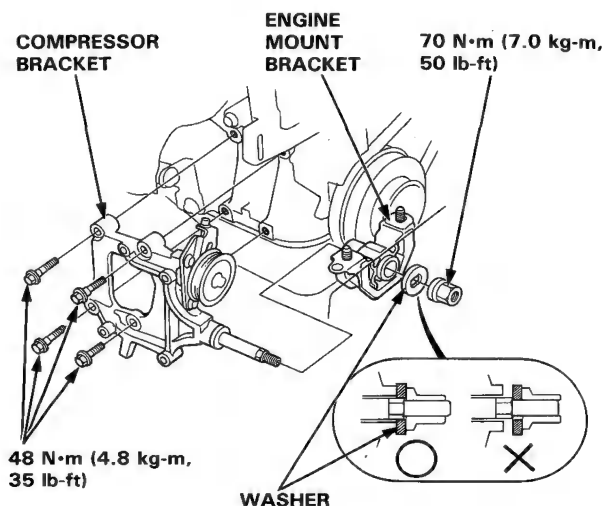


7. If necessary, remove the compressor bracket as shown.

— Remove the nut, washer and left engine mount bracket.

NOTE: When tightening the left engine mount bracket, make sure the washer is set properly on the engine mount bolt as shown.

— Remove the compressor bracket mounting bolts (4) and bracket.

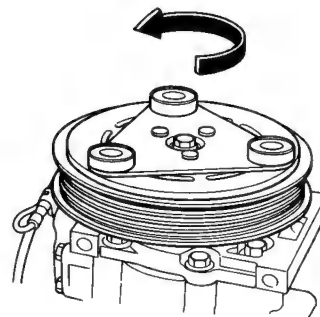


8. Install the removed parts in the reverse order of removal and:

- If a new compressor is installed, calculate the refrigerant oil as below and drain through the suction fitting on the compressor:
140 cc (4-2/3 fl-oz) minus contents of old compressor, equals amount to drain from new compressor.
- Do not damage the condenser fins when removing/installing the compressor.
- Adjust compressor belt tension (page 22-47).
- Charge the A/C system (page 22-49).
- Test the A/C system performance (page 22-20).

Clutch Inspection

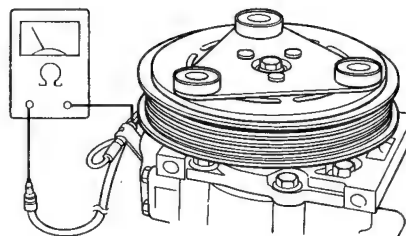
- Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the rotor pulley with a new one if it is noisy or has excessive play/drag.



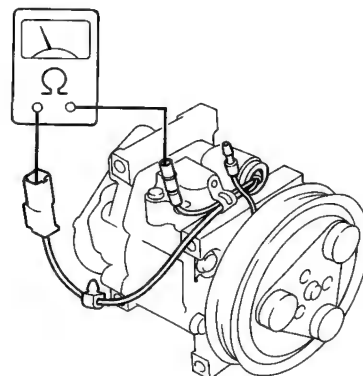
- Check resistance of field coil.

Field Coil resistance: 3.33 ± 0.17 ohm at 20°C (68°F)

If resistance is not within specifications, replace the field coil.



- Check the thermal protector for continuity between its connectors.



(cont'd)

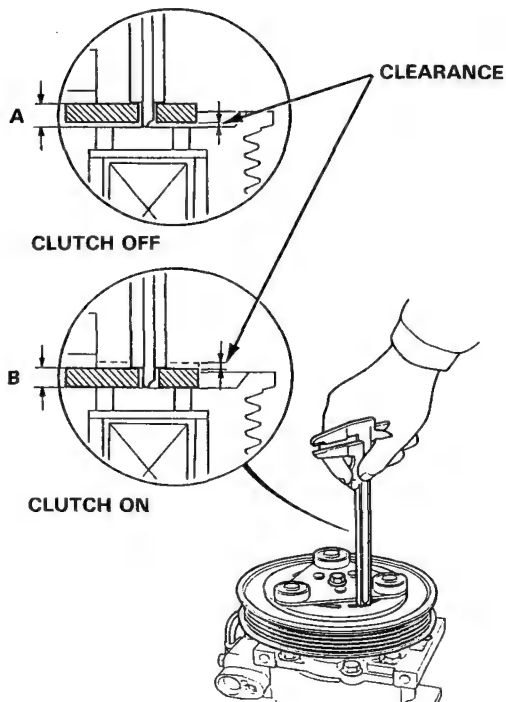
Compressor (Matsushita)

Clutch Inspection (cont'd)

- Measure the clearance between the armature and rotor pulley. If the clearance is not within specified limits, the armature must be removed and shims added or removed as required.

CLEARANCE: 0.4–0.6 mm (0.016–0.024 in)

CLEARANCE = A (CLUTCH OFF) – B (CLUTCH ON)

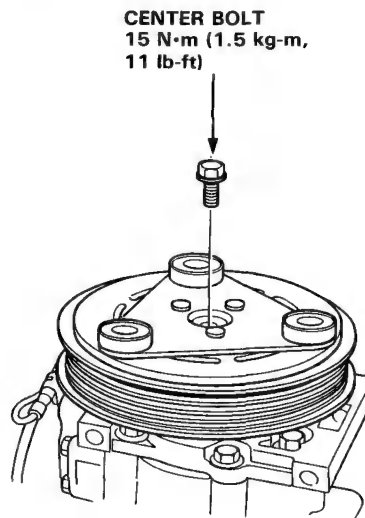


NOTE: The shims are available in two sizes: 0.2 mm and 0.5 mm of thickness.

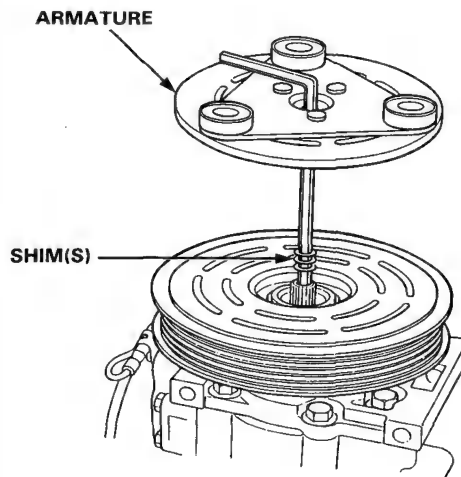
Clutch Overhaul

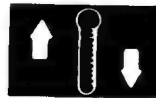
Removal

1. Remove the center bolt while holding the armature with a special tool.



2. Remove the armature and shim(s) with care not to lose the shim(s).

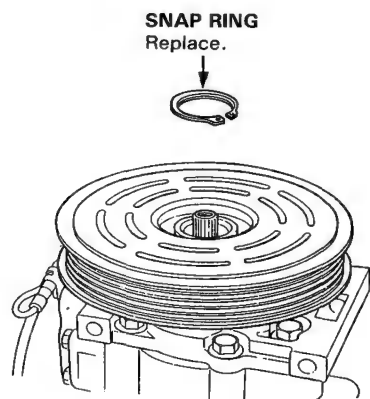




3. Remove the snap ring with a snap ring pliers.

NOTE:

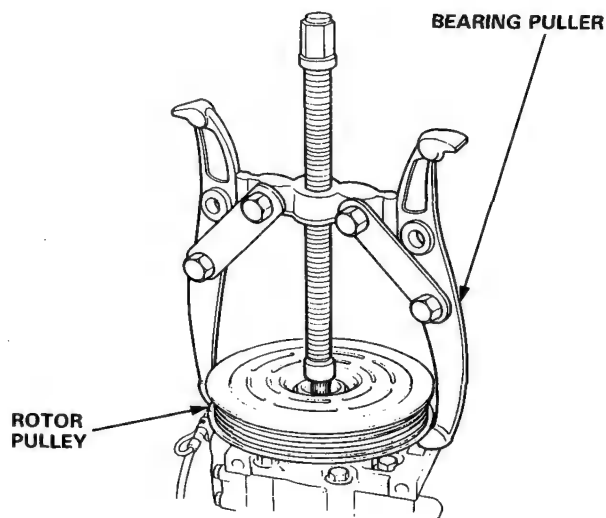
- Be careful not to damage the rotor pulley and compressor during removal/installation.
- Once the snap ring is removed, replace it with a new one.



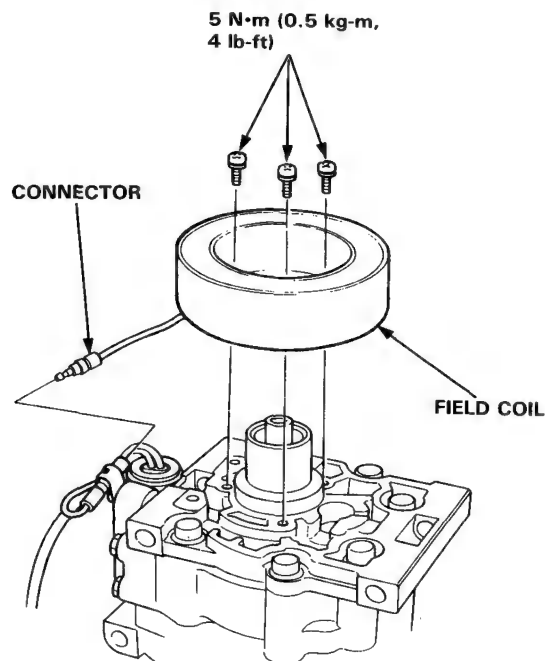
4. Using a bearing puller, remove the rotor pulley from the compressor shaft.

NOTE:

- Do not put the claws of puller on the belt fitting surface of the rotor pulley but the back of the pulley or rotor pulley will be deformed.
- When the rotor pulley is tight, do not attempt to remove forcibly. In such case, replace the compressor as an assembly.



5. Disconnect the field coil connector. Remove the screws (3) and field coil.



Installation

1. Install the field coil with its connector facing to the thermal protector and secure the field coil with the screws (3).

(cont'd)

Compressor (Matsushita)

Clutch Overhaul (cont'd)

2. NOTE:

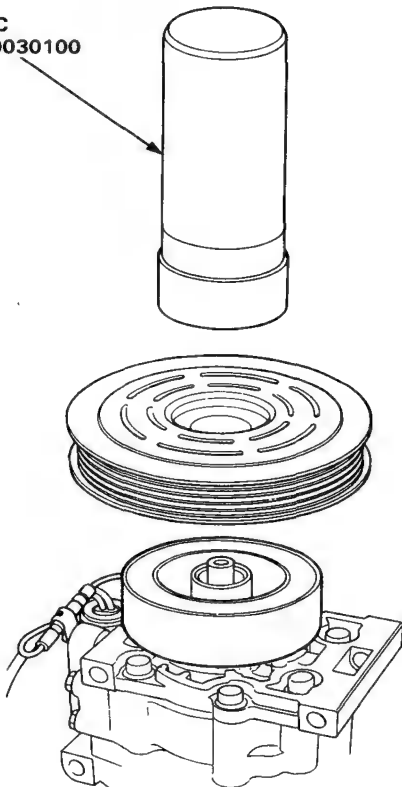
- In the case where the rotor pulley is installed obliquely on the front plate boss, remove it and reinstall perpendicularly.
- Press the bearing inner for rotor pulley installation.
- After installing the rotor pulley, check the pulley bearing for crack or damage.

Make sure that front plate boss and pulley bearing inner surface are free from debris.

After applying lubricant to the front plate boss, install the rotor pulley perpendicularly onto the boss. If the pulley is tight, install it with a special tool.

Maximum load: 0.4 t

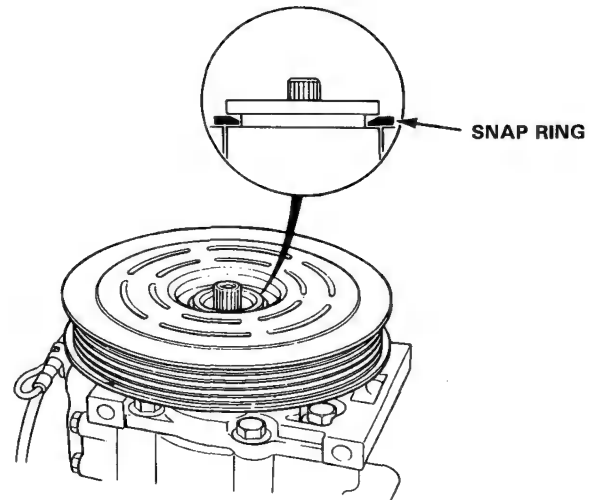
DRIVER
HANDLE C
07746-0030100



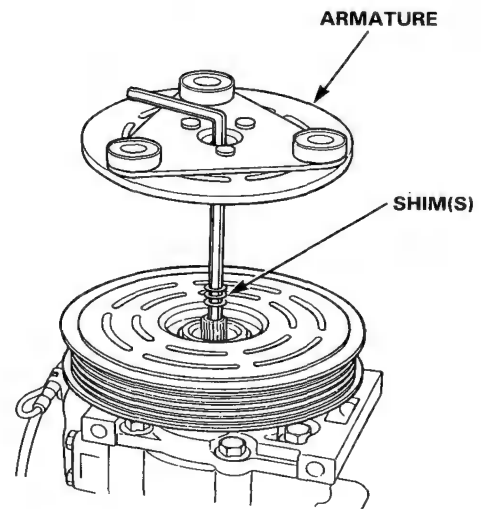
3. Using a snap ring plier, install the snap ring in the groove of the front plate boss.

NOTE:

- Install the snap ring with the chambered side facing out.
- Make sure that the snap ring fits snugly in the groove.



4. NOTE: Before installing the armature, remove dirt or grease from the mating surfaces of the armature and rotor pulley. Install the shim(s) and armature.

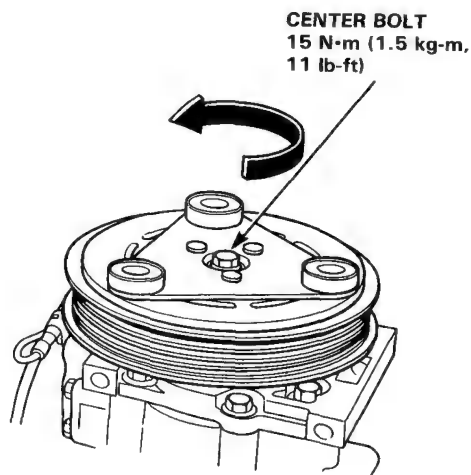




5. Apply a locking agent to the center bolt threads and tighten it.

Torque: 1.5 kg-m

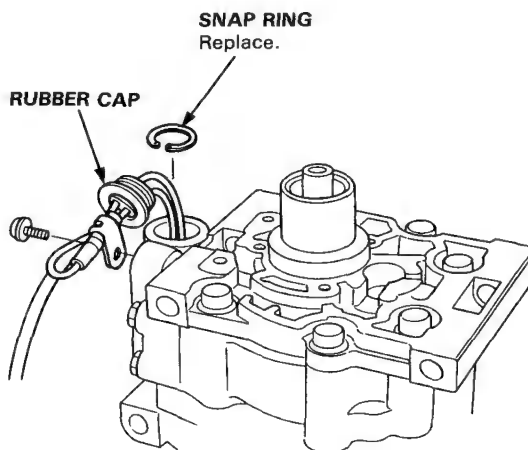
Make sure that the rotor pulley turns smoothly by turning it with hand.



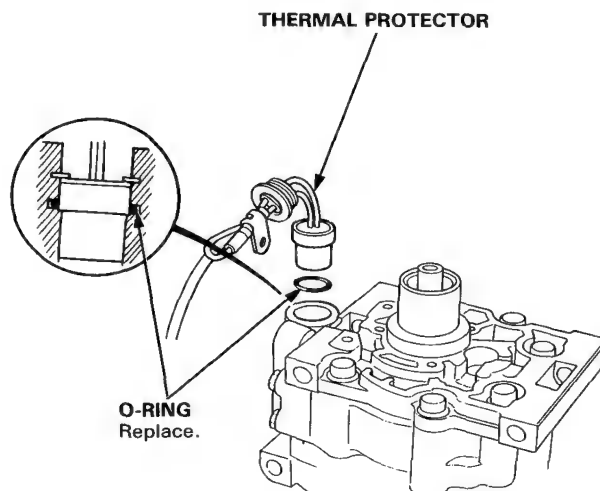
6. Connect the field coil connector and clamp it to keep away from the rotor pulley.

Thermal Protector Replacement

1. Remove the armature, rotor pulley and field coil (page 22-28).
2. Pull the rubber cap out from the compressor.
3. Remove the screw and wire clip.
4. Remove the snap ring and thermal protector.



5. Install in the reverse order of removal and:
 - Replace the O-ring and snap ring with new ones.
 - Set the new O-ring in place as shown.



Compressor (Matsushita)

Shaft Seal Replacement

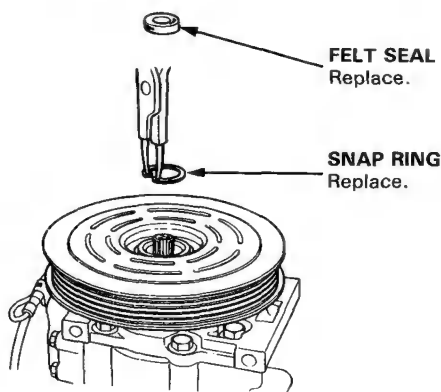
NOTE: Make sure that the suction and discharge joints are plugged with the caps.

1. Remove the armature (page 22-28).

NOTE: Rotor pulley and field coil are not necessary to be removed.

2. Remove the felt seal and snap ring.

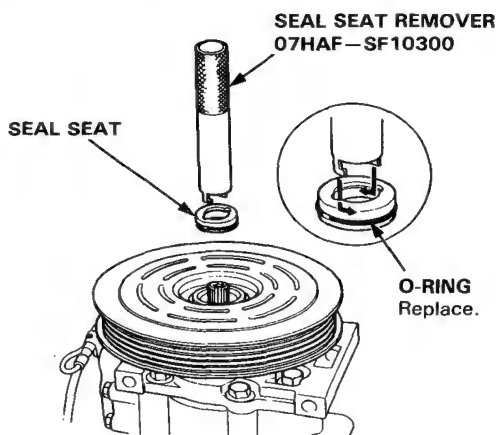
NOTE: Replace the snap ring with a new one.



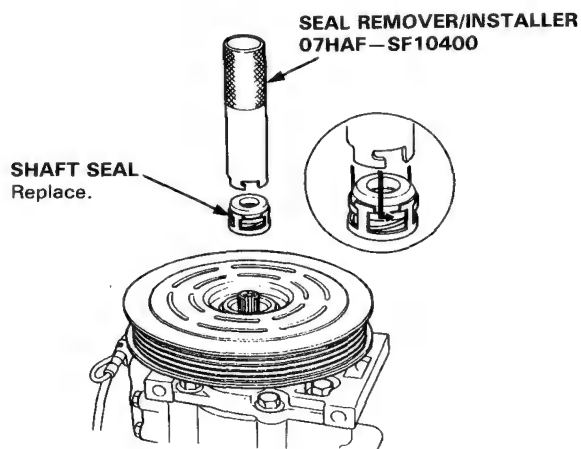
3. Remove the shim(s).

NOTE: After removing, store the shim(s) in a clean container to prevent losing it.

4. Insert the special tool into the compressor aligning the cutout of the remover with the groove of the seal seat.
5. Rotate the special tool counterclockwise to make sure that the cutout is engaged with the seal seat.
6. Pull out the seal seat.



7. Insert the special tool into the compressor aligning the cutout of the remover with the metal pawl of the seal case.
8. Rotate the special tool counterclockwise to make sure that the cutout is engaged with the metal pawl.



9. Withdraw the remover.
10. Lay down the compressor and clean the shaft seal contacting face of the compressor with cleaning solvent.

CAUTION:

- Keep the cleaning solvent and dirt out of the compressor.
- Do not use any cloth for cleaning. Clean only by rinsing with solvent.
- Do not spill the refrigerant oil from the compressor. Refill the same amount of the oil if the oil is spilled out.

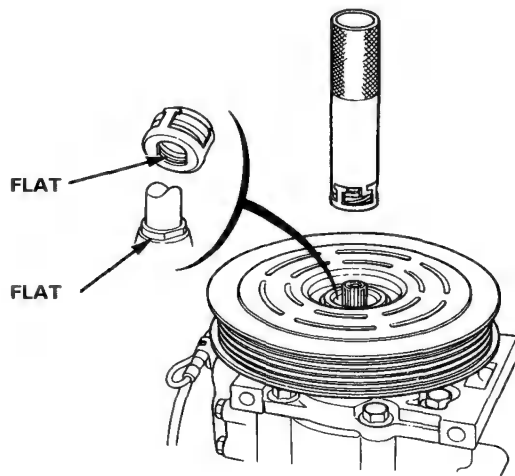
11. Clean the new shaft seal thoroughly with cleaning solvent.
12. Lubricate the shaft seal with refrigerant oil (SNISO 5GS or equivalent) and install it on the shaft seal remover.

NOTE:

- Use only clean refrigerant oil.
- Do not touch the sealing surfaces of the shaft seal after lubricating.



13. Liberally lubricate the compressor shaft with refrigerant oil.
14. Install the shaft seal onto the compressor shaft aligning the seal case flats with the shaft flats.



15. Clean the seal seat with cleaning solvent, then lubricate the seal seat with refrigerant oil (SUNISO 5GS or equivalent).

NOTE:

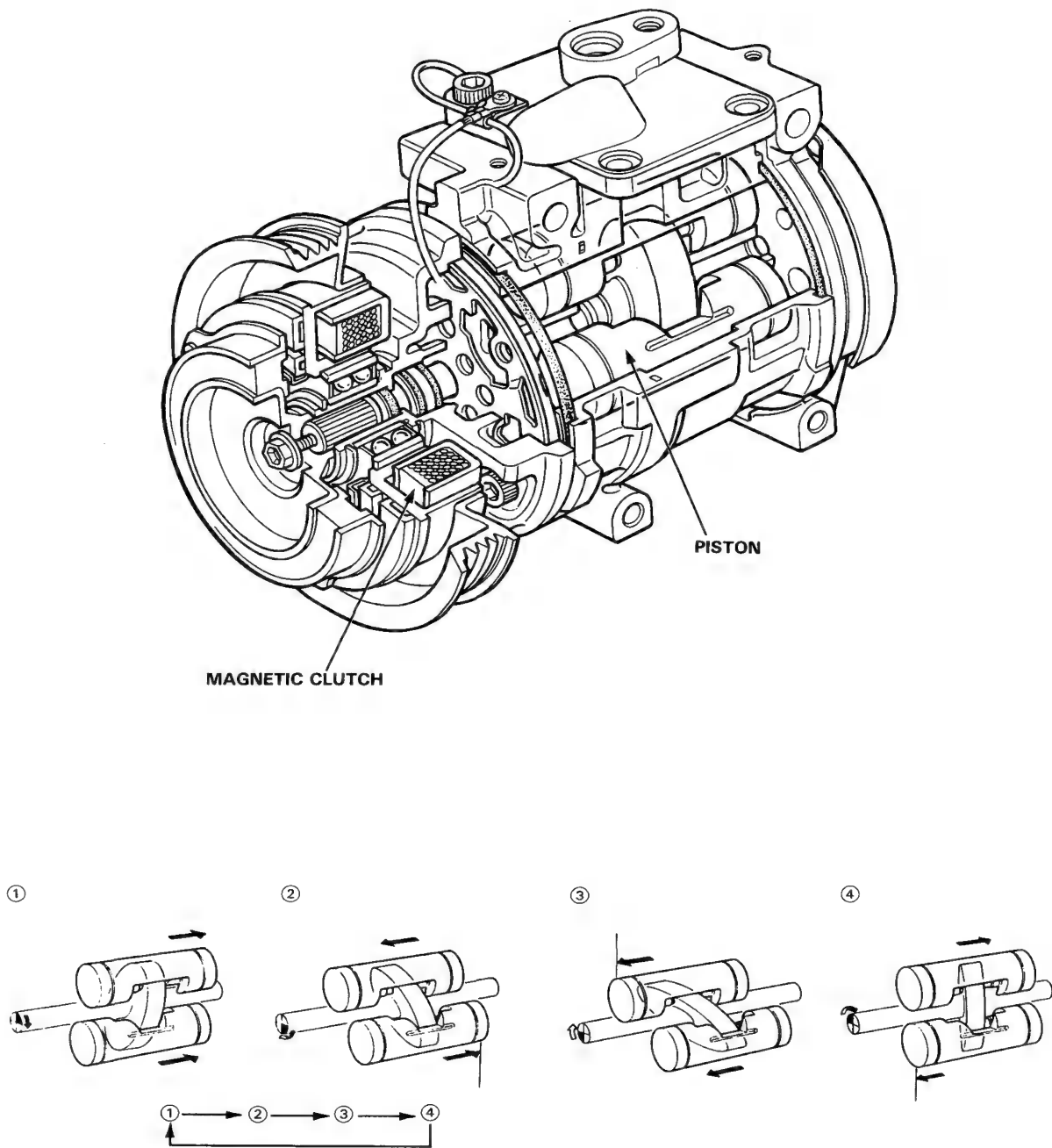
- Use only clean refrigerant oil.
- Do not touch the sealing surface of the seal plate after lubricated.

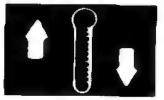
16. First slide the seal seat into the compressor by hand as far as possible.
17. Press the seal seat with the grip side of the remover.
18. Install the snap ring with its chamfered edge inside.
19. Press the snap ring with the grip side of the remover, then install the felt seal.
20. Install the shim(s).
21. Install the pressure plate. Measure the clearance between the rotor pulley and armature all the way around. If the clearance is not within the specified limits, 0.4—0.6 mm (0.016—0.024 in) shim(s) must be added or removed as required.

Compressor (Nippondenso)

Description

This compressor is a piston type. A revolving inclined disc drives the surrounding 10 reciprocating pistons. As the inclined disc revolves, it pushes the pistons, protected by a ceramic shoe, thus compressing the refrigerant.

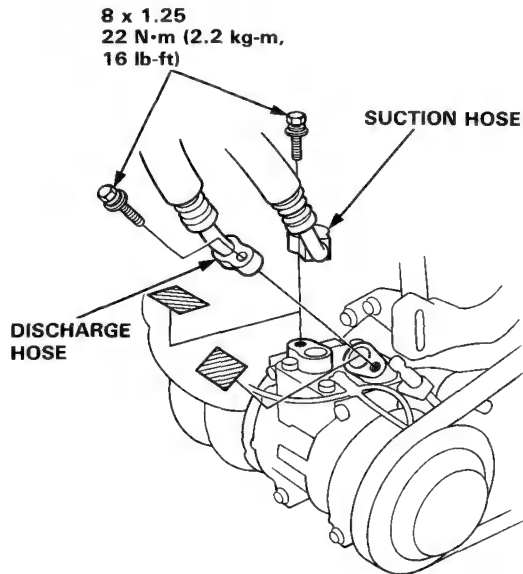




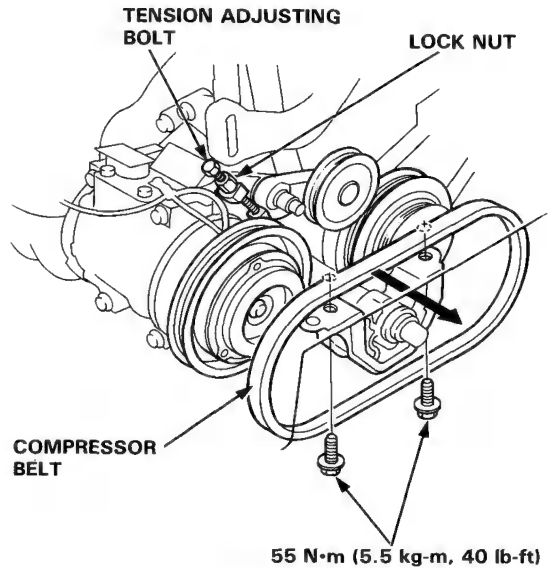
Replacement

1. If the compressor is marginally operable, run the engine at idle speed and turn the air conditioner fan for a few minutes, then shut the engine off and disconnect the battery negative terminal.
2. Discharge the refrigerant from the system (page 22-19).
3. Remove the power steering pump (Section 17).
4. Remove the bolts (2) and disconnect the suction hose and discharge hose from the compressor.

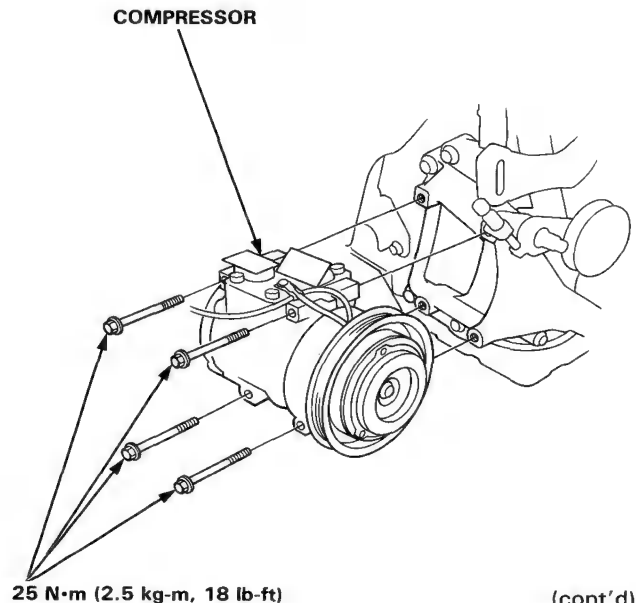
CAUTION: Cap the open fittings immediately to keep moisture out of the system.



5. Loosen the compressor belt tension adjusting bolt and remove the belt from the pulleys. Remove the left engine mount bracket bolts (2) and pass the belt through the gap between the body and left engine mount bracket.



6. Disconnect the compressor clutch 1P connector. Remove the compressor mounting bolts (4) and compressor.



(cont'd)

Compressor (Nippondenso)

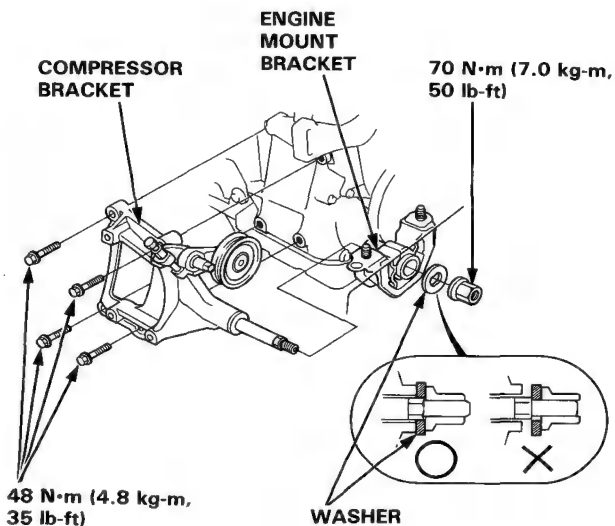
Replacement (cont'd)

7. If necessary, remove the compressor bracket as follows:

- Remove the nut, washer and left engine mount bracket.

NOTE: When tightening the left engine mount nut, make sure the washer is set properly on the engine mount bolt as shown.

- Remove the compressor bracket mounting bolts (4) and bracket.



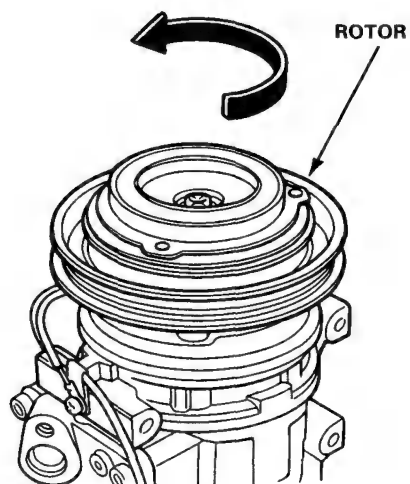
8. Install the removed parts in the reverse order of removal and:

- If a new compressor is installed, calculate the refrigerant oil as below and drain through the suction fitting on the compressor:
80 cc (2-2/3 fl-oz) minus contents of old compressor, equals amount to drain from new compressor.
- Do not damage the condenser fins when removing/installing the compressor.
- Adjust compressor belt tension (page 22-47).
- Charge the A/C system (page 22-49).
- Test the A/C system performance (page 22-20).



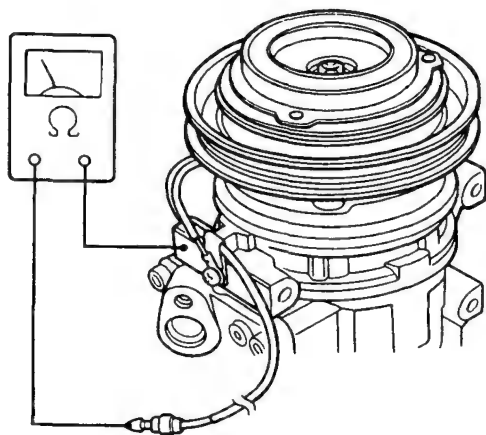
Clutch Inspection

- Check rotor bearing play and drag by rotating the rotor by hand. Replace the rotor with a new one if it is noisy or has excessive play/drag.



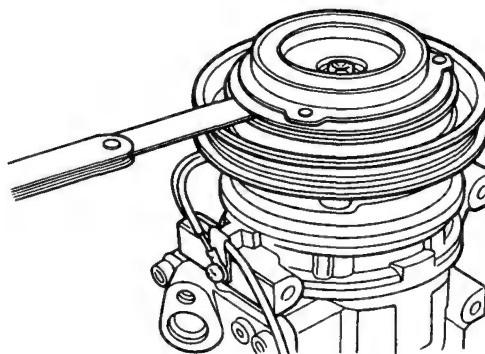
- Check resistance of the stator:
Stator Resistance: 3.6 ± 0.2 ohm at 20°C (68°F)

If resistance is not within specifications, replace stator.



- Measure the clearance between the rotor and center piece all the way around. If the clearance is not within specified limits, the center piece must be removed and shims added or removed as required.

CLEARANCE: 0.35—0.65 mm (0.014—0.026 in)

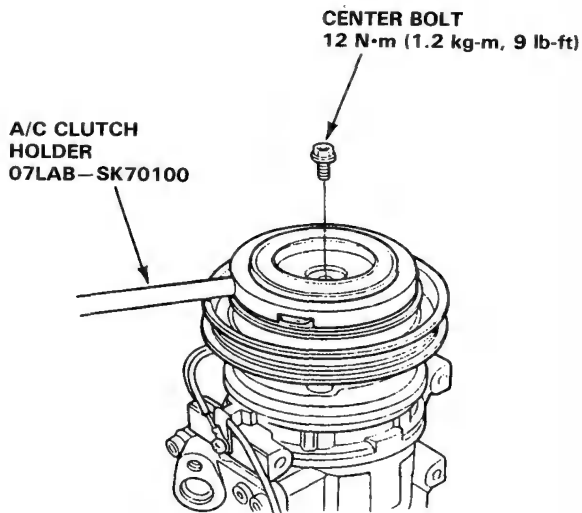


NOTE: The shims are available in three sizes: 0.1 mm, 1.0 and 1.5 mm of thickness.

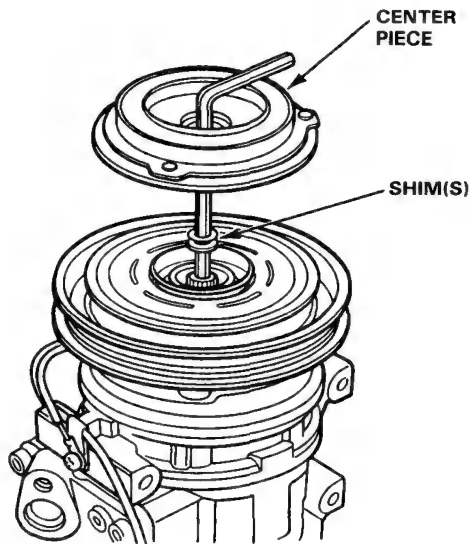
Compressor (Nippondenso)

Clutch Overhaul

1. Remove the center bolt and washers.



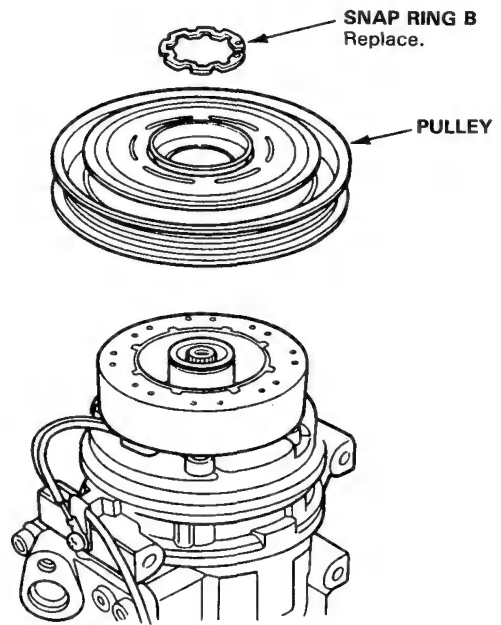
2. Remove the center piece and shim(s) taking care not to lose the shims.

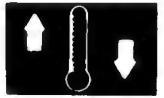


3. Use snap ring pliers to remove the snap ring B, then remove the pulley.

NOTE:

- Be careful not to damage the rotor and compressor during removal/installation.
- Once the snap ring was removed, replace it with a new one.

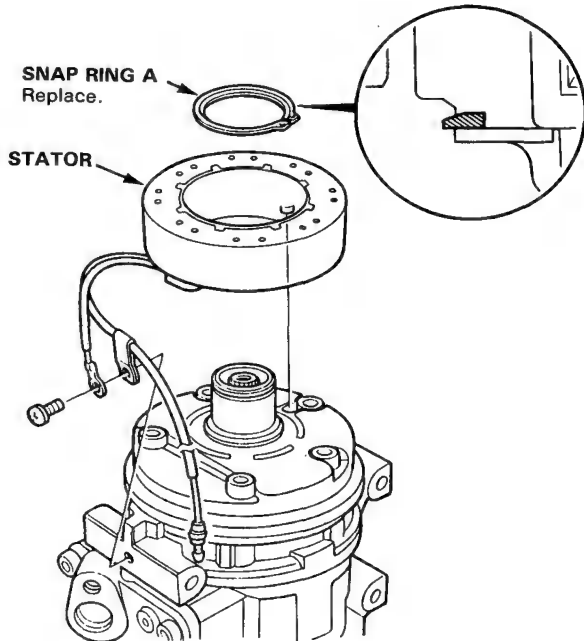




4. Remove the snap ring A and the stator.

NOTE:

- Be careful not to damage the compressor during removal/installation.
- Once the snap ring was removed, replace it with a new one.



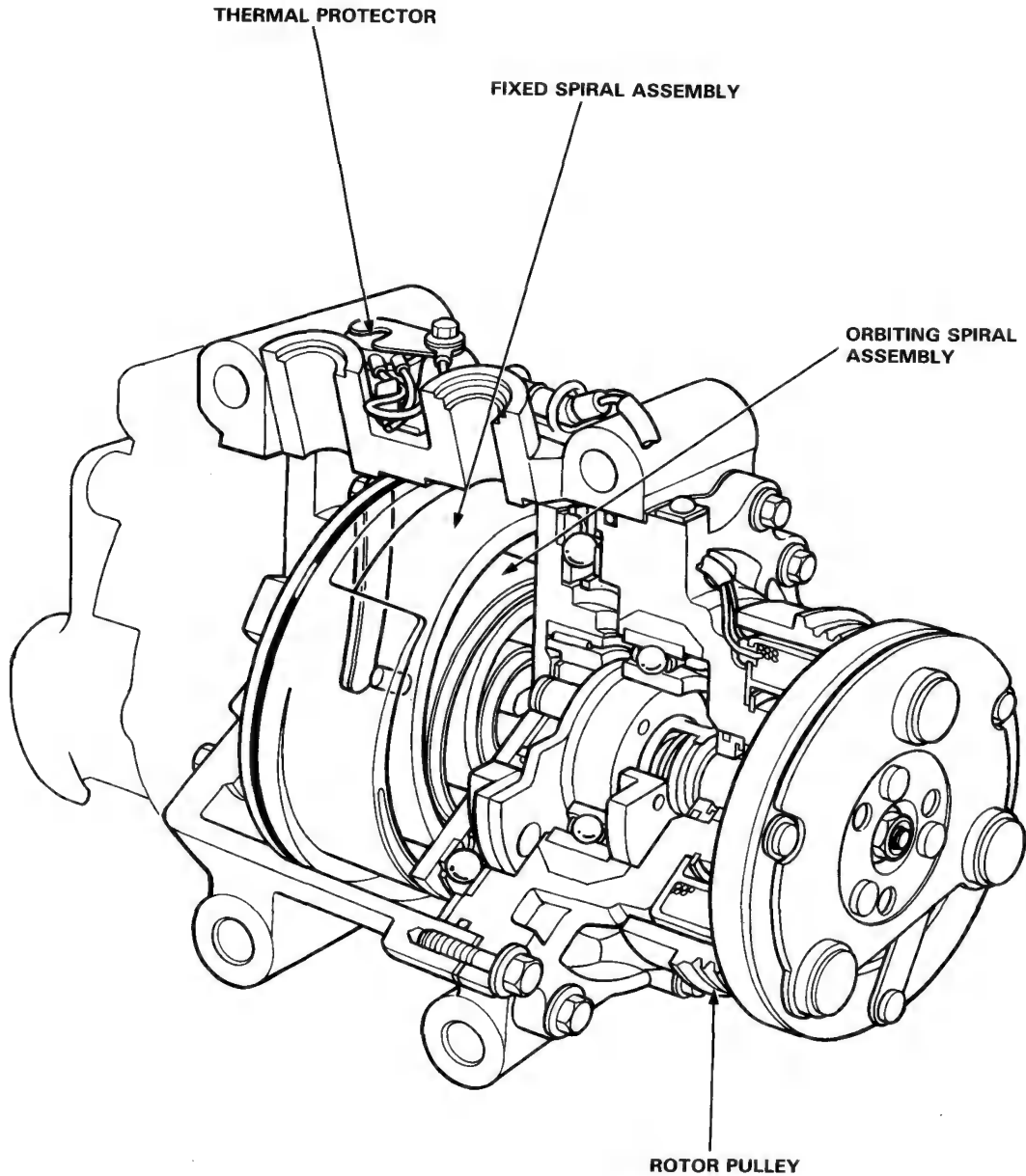
5. Install in the reverse order of removal and:

- Install the stator with the wire side facing up (see above).
- Clean the rotor and compressor sliding surfaces with non-petroleum solvent.
- Check the rotor bearings for excessive play.
- Make sure the snap ring is fitted to the groove properly (see above).
- Apply a locking agent to the threads of the center bolt and tighten it securely.
- Make sure that the rotor turns smoothly.

Compressor (Sanden)

Description

This compressor is the spiral type. Refrigerant is compressed between a fixed spiral assembly and an orbiting spiral assembly. A thermal protector is installed on this compressor.

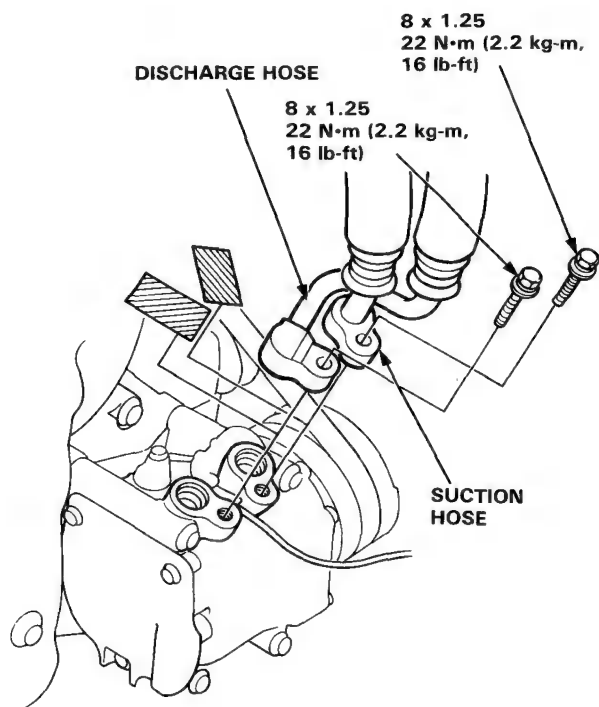




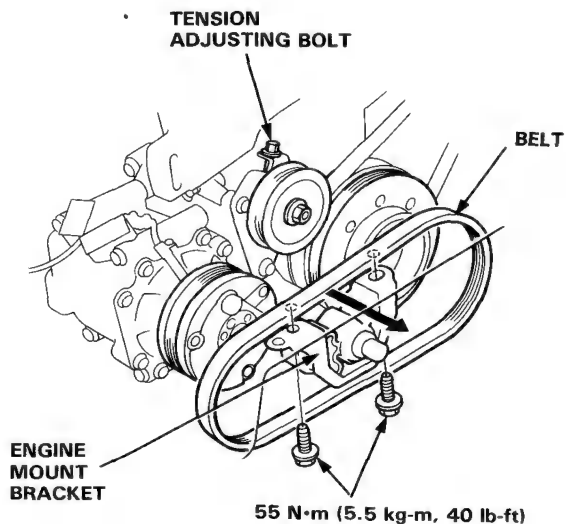
Replacement

1. If the compressor is marginally operable, run the engine at idle speed and turn the air conditioner fan for a few minutes, then shut the engine off and disconnect the battery negative terminal.
2. Discharge the refrigerant from the system (page 22-19).
3. Remove the power steering pump (Section 17).
4. Remove the bolts (2) and disconnect the suction hose and discharge hose from the compressor.

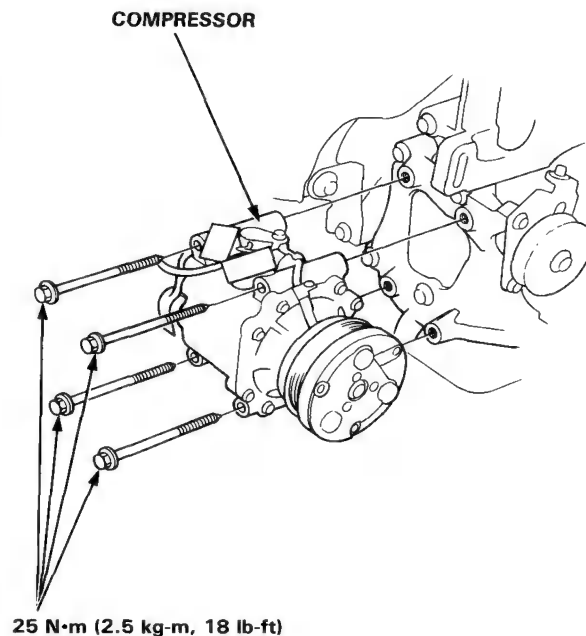
CAUTION: Cap the open fittings immediately to keep moisture out of the system.



5. Loosen the compressor belt tension adjusting bolt and remove the belt from the pulleys. Remove the left engine mount bracket bolts (2) and pass the belt through the gap between the body and left engine mount bracket.



6. Disconnect the compressor clutch 1P connector. Remove the compressor mounting bolts (4) and compressor.



(cont'd)

Compressor (Sanden)

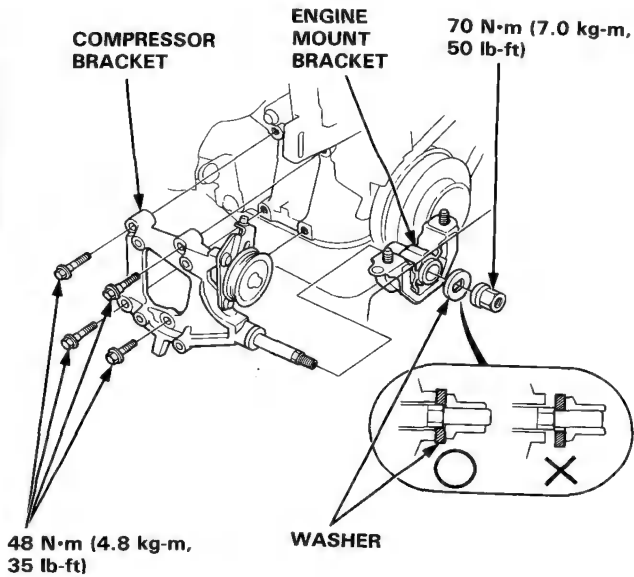
Replacement (cont'd)

7. If necessary, remove the compressor bracket as follows:

— Remove the nut, washer and left engine mount bracket.

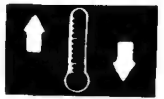
NOTE: When tightening the left engine mount nut, make sure the washer is set properly on the engine mount bolt as shown.

— Remove the compressor bracket mounting bolts (4) and bracket.



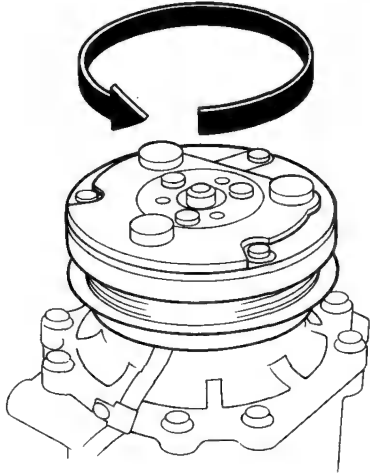
8. Install the removed parts in the reverse order of removal and:

- If a new compressor is installed, calculate the refrigerant oil as below and drain through the suction fitting on the compressor:
120 cc (4 fl-oz) minus contents of old compressor, equals amount to drain from new compressor.
- Do not damage the condenser fins when removing/installing the compressor.
- Adjust compressor belt tension (page 22-47).
- Charge the A/C system (page 22-49).
- Test the A/C system performance (page 22-20).



Clutch Inspection

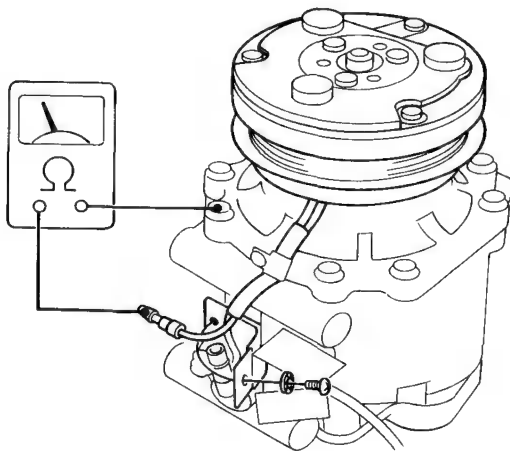
- Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the rotor pulley with a new one if it is noisy or has excessive play/drag.



- Release the compressor clutch connector from the connector holder.
Check the field coil for resistance:

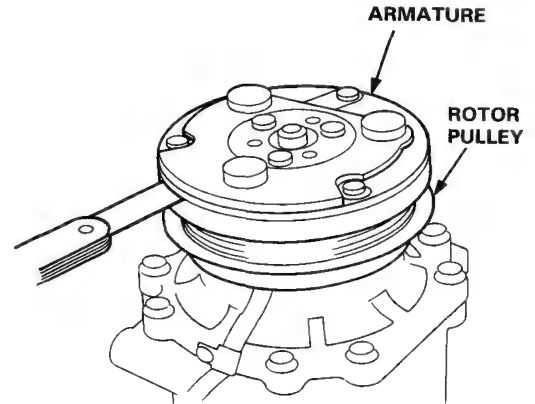
Field Coil resistance:
 $2.8 \pm 0.15 \text{ ohm at } 20^\circ\text{C (68}^\circ\text{F)}$

If resistance is not within specifications, replace the field coil.

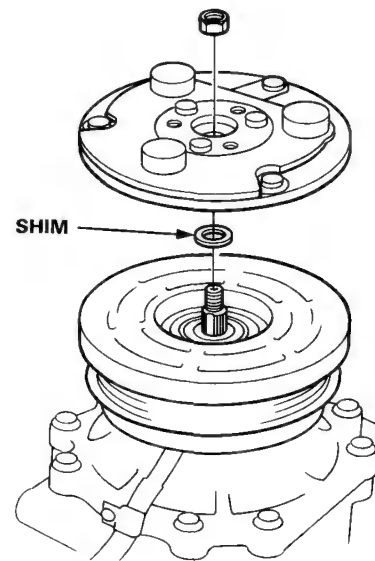


- Measure the clearance between the rotor pulley and armature. If the clearance is not within specified limits, the armature must be removed and shims added or removed as required.

CLEARANCE: 0.35–0.65 mm (0.014–0.026 in)



NOTE: The shims are available in four sizes: 0.1 mm, 0.2 mm, 0.4 mm and 0.5 mm of thickness.

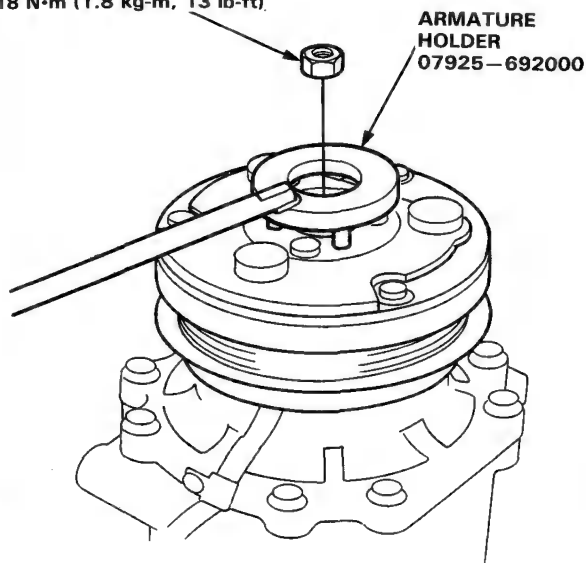


Compressor (Sanden)

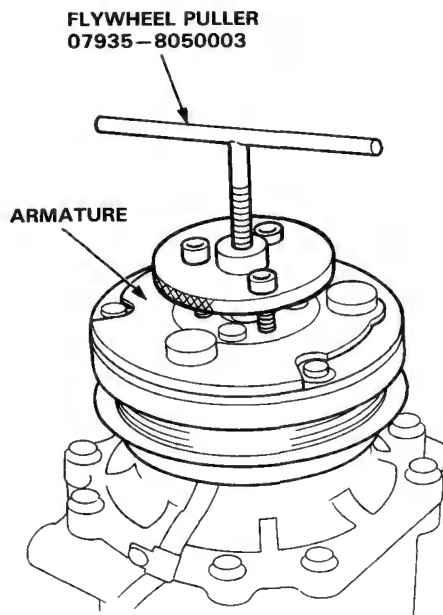
Clutch Overhaul

1. Remove the center nut while holding the armature.

18 N·m (1.8 kg-m, 13 lb-ft)

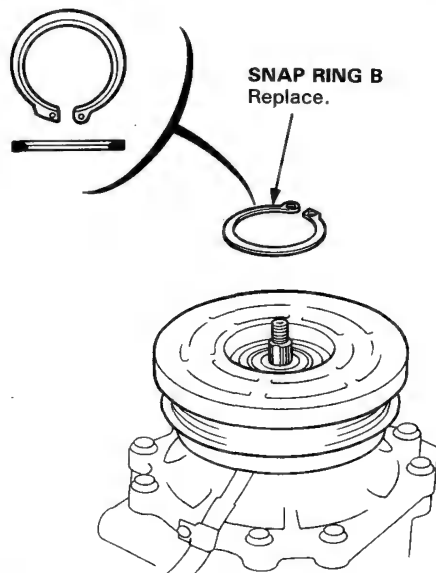


2. Using the special tool, remove the armature and shim(s).



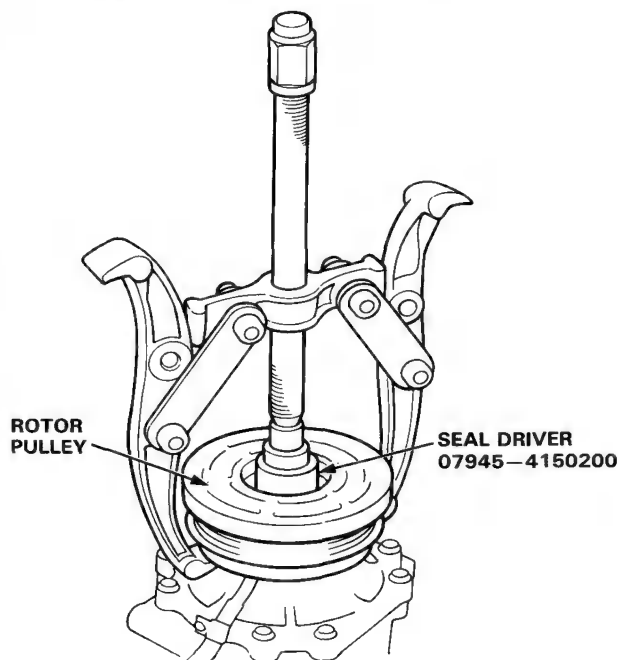
3. Remove the snap ring B with a snap ring pliers.

NOTE: Once the snap ring B is removed, replace it with a new one.



4. Remove the rotor pulley from the shaft with a pulley and the special tool.

NOTE: Put the claws of the puller on the back of the pulley, not the belt area, or the slipping will result.

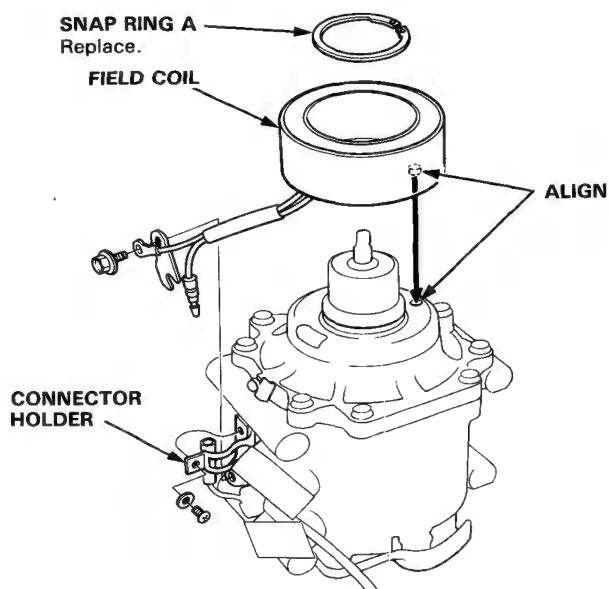




5. Remove the snap ring A with a snap ring pliers. Release the field coil connector from the connector holder and disconnect the connector and field coil ground terminal. Remove the field coil from the compressor cover.

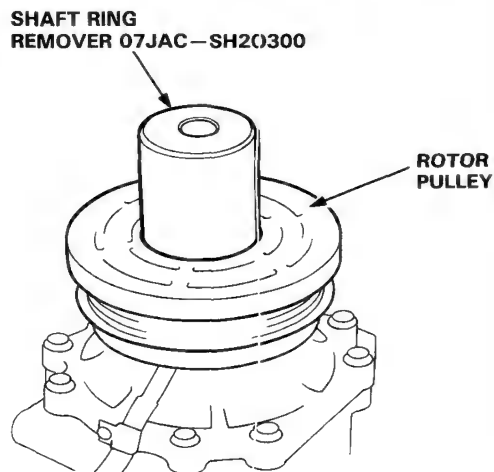
NOTE:

- Once the snap ring A is removed, replace it with a new one.
- When installing the field coil, align the boss on the field coil with the hole in the compressor.



6. Press the rotor pulley onto the field coil with a shaft ring remover.

CAUTION: Maximum press load: 0.4 tons.



7. Install the removed parts in the reverse order of removal and:

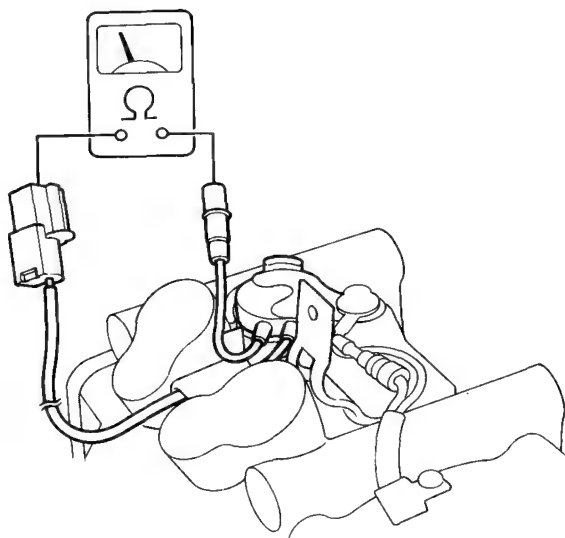
- Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
- Install the snap rings with the chamfered side facing out and make sure the snap rings are fitted to the groove completely.
- After installing, make sure that the rotor pulley turns smoothly.
- Route and clamp the wires properly or they can be damaged by the rotor pulley.

Compressor

Thermal Protector Inspection

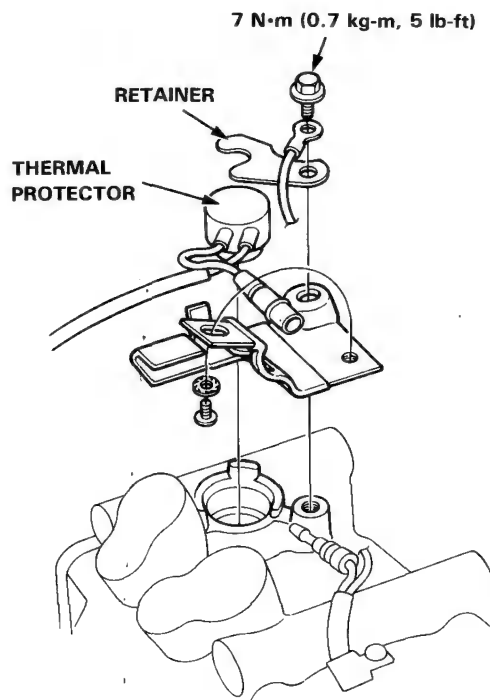
Disconnect the thermal protector connectors and check for continuity between the connectors of the thermal protector. There should be continuity.

If there is no continuity, replace the thermal protector.

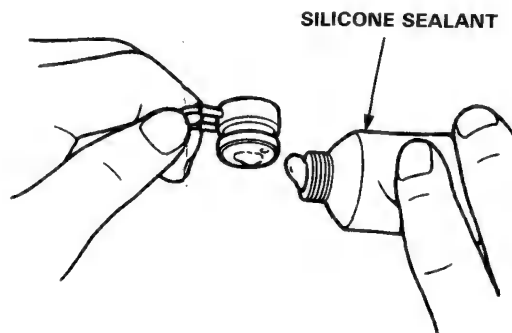


Thermal Protector Replacement

1. Remove the bolt, field coil terminal and thermal protector retainer.
2. Remove the thermal protector.
Remove the residue of silicone sealant from the cup of thermal protector.



3. Apply silicone sealant to the top of the thermal protector.



4. Install in the reverse order of removal.

Belt Adjustment



1. Apply a force of 100 N (10 kg, 22 lb) and measure the deflection between the A/C compressor and crankshaft pulleys.

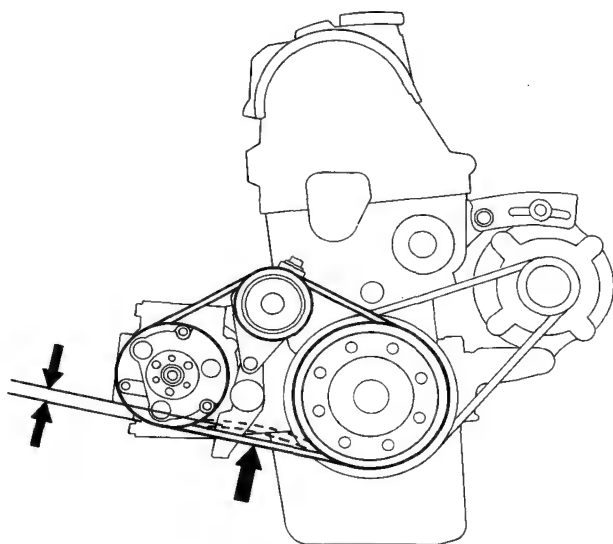
Deflection:

Used Belt: 6.5—10.5 mm (0.26—0.41 in)

New Belt: 5.0—7.0 mm (0.20—0.31 in)

NOTE:

- If there are cracks or any damage evident on the belt, replace it with a new one.
- "Used belt" means a belt which has been used for five minutes or more.
- "New belt" means a belt which has been used for less than five minutes.



Measure with Belt Tension Gauge:

Attach the belt tension gauge to the belt and measure the tension of the belt.

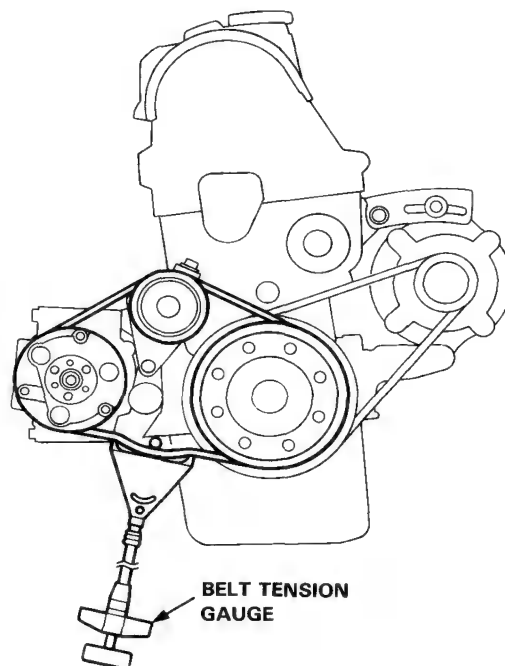
Tension:

Used Belt: 350—500 N (35—50 kg, 77—110 lb)

New Belt: 600—800 N (60—80 kg, 132—176 lb)

NOTE:

- If there are cracks or any damage evident on the belt, replace it with a new one.
- See the instructions for the tension gauge.



2. Loosen the A/C adjust pulley nut or bolt and the adjusting bolt lock nut.
3. Turn the adjusting bolt to get proper belt tension, then retighten the bolt and nuts.
4. Recheck the deflection of the belt.

Condenser Replacement

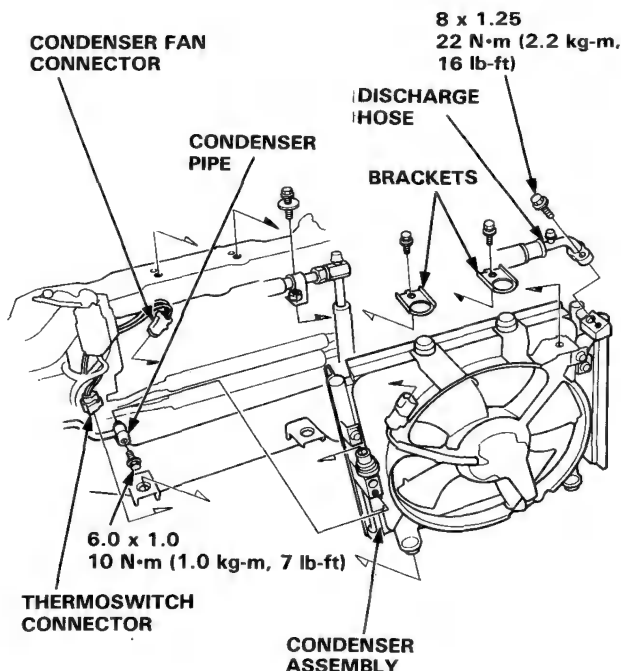
1. Discharge refrigerant from the system using a refrigerant recovery system (page 22-19).
2. Disconnect the thermo switch connector and condenser fan connector.
3. Disconnect the discharge hose and condenser pipe from the condenser.

CAUTION: Cap the open fittings immediately to keep moisture and dirt out of the system.

4. Remove the suction hose clamp bolt and condenser brackets.
5. Remove the condenser assembly by pulling it up.

NOTE:

- Be careful not to damage the condenser fins when removing/installing the condenser.
- Be careful not to hit the side of the radiator during removal/installation.



6. Install the removed parts in the reverse order of removal and:
 - Replace O-rings with new ones at the pipe joints.
 - Charge the A/C system (page 22-49).
 - Test the A/C system performance (page 22-20).

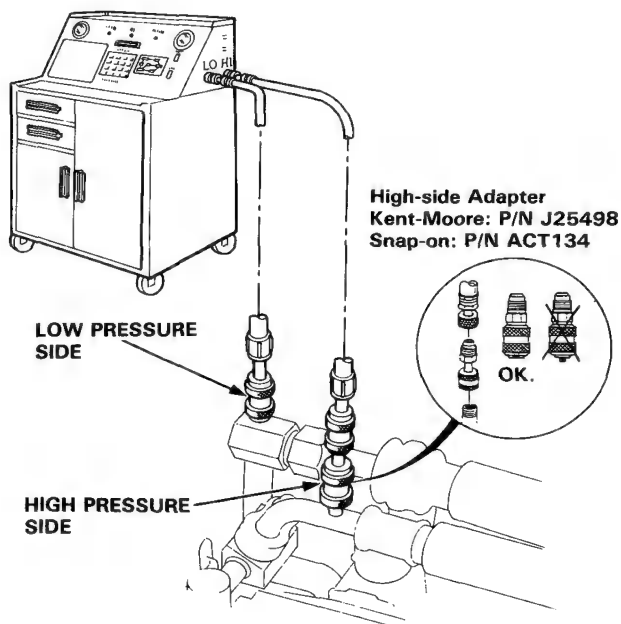
A/C System Service

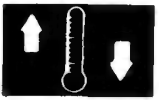
A/C System Evacuation

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced).
2. Attach an Air Conditioning Service Station as shown.
Follow the equipment manufacturer's instructions.

NOTE:

- Connect the adapter to the high pressure hose first, then connect the hoses to the car as shown. When testing is completed, disconnect the hose adapter from the high-side fitting; do not disconnect the hose from the adapter, or refrigerant may escape from the system.
- If low pressure does not reach more than 700 mmHg (27 in-Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system and check for leaks (see page 22-50 for leak test).





A/C System Charging

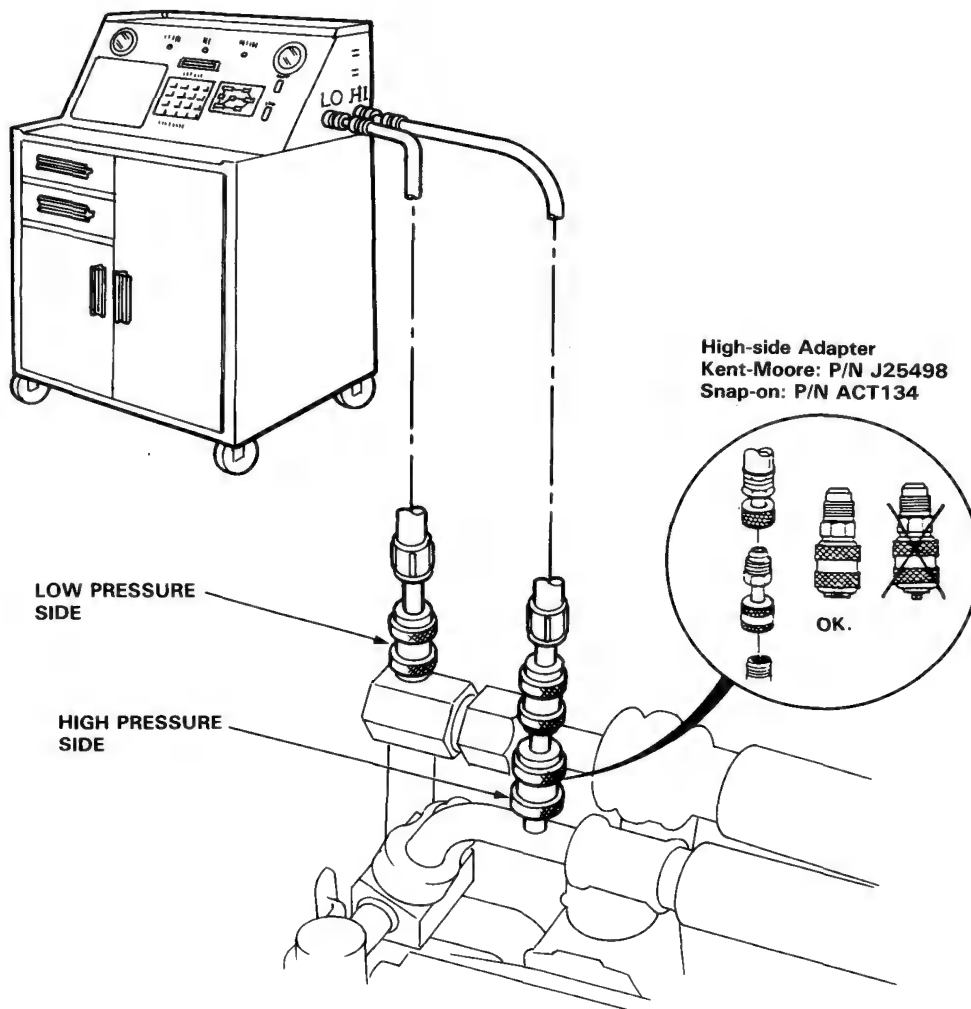
Refrigerant capacity: 600—650 g (21—23 oz)

⚠ WARNING Always wear eye protection when charging the system.

CAUTION: Do not overcharge the system; the compressor will be damaged.

Attach an Air Conditioning Service Station as shown. Follow the equipment manufacturer's instructions.

NOTE: Connect the adapter to the high pressure hose first, then connect the hoses to the car as shown. When testing is completed, disconnect the hose adapter from the high-side fitting; do not disconnect the hose from the adapter, or refrigerant may escape from the system.



A/C System Service

Leak Test

⚠ WARNING When handling refrigerant (R-12):

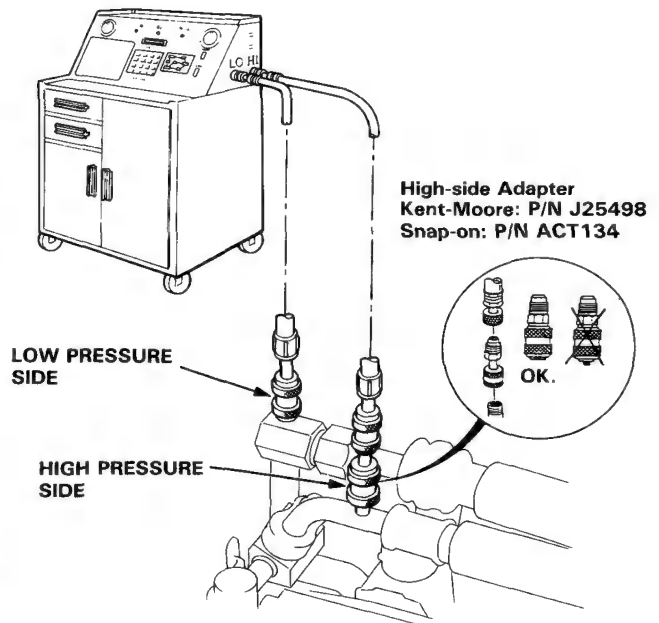
- Always wear eye protection.
- Do not let refrigerant get on your skin or in your eyes.
If it does:
 - Do not rub your eyes or skin.
 - Splash large quantities of cool water in your eyes or on your skin.
 - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (cans of R-12) stored below 40°C (100°F).
- Keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- Work in a well-ventilated area. Refrigerant evaporates quickly and can force all the air out of a small, enclosed area.

IMPORTANT: Do not vent refrigerant to the atmosphere. The chlorofluorocarbons (CFCs) used in conventional refrigerant (R-12) may damage the earth's ozone layer. Always use UL-listed, refrigerant recovery/recycling equipment to extract the refrigerant before you open an A/C system to make repairs. Follow the equipment manufacturer's instructions.

1. Attach an Air Conditioning Service Station as shown.

NOTE: Connect the adapter to the high pressure hose first, then connect the hoses to the car as shown. When testing is completed, disconnect the hose adapter from the high-side fitting; do not disconnect the hose from the adapter, or refrigerant may escape from the system.

2. Open high pressure valve to charge the system to about 100 kPa (14 psi), then close the supply valve.
3. Check the system for leaks using an electronic leak tester.
Follow the manufacturer's instructions.
4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), release any charge in the system according to the Discharge Procedure on page 22-19.
5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-48).



Test

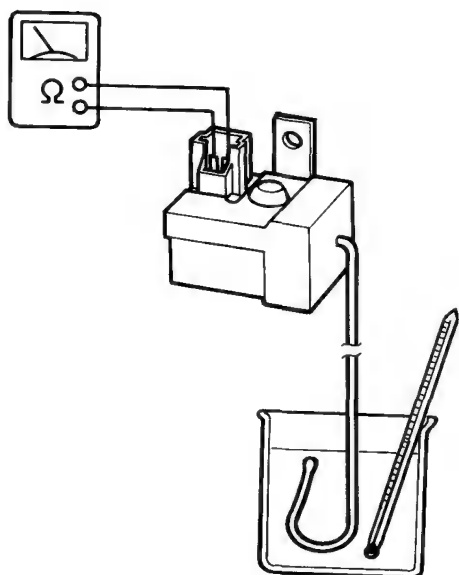
A/C Thermo Switch

Dip A/C thermo switch into a pan filled with ice water, and check for continuity between the terminals.

Cut off: 1.5—-0.5°C (35—33°F)

Cut in: 2.5—5°C (36—41°F)

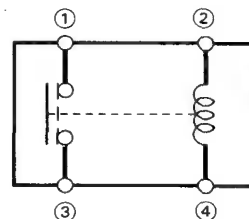
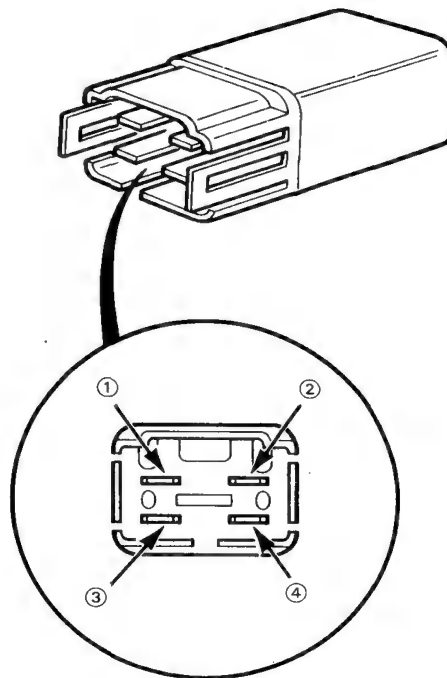
If cut off or cut in temperature is too low or too high, replace the thermo switch.



Relay

NOTE: All A/C system relays are similar.



1. Check for continuity between terminals ① and ③.
2. Connect a 12 V battery across terminals ② and ④. There should be continuity between terminals ① and ③.

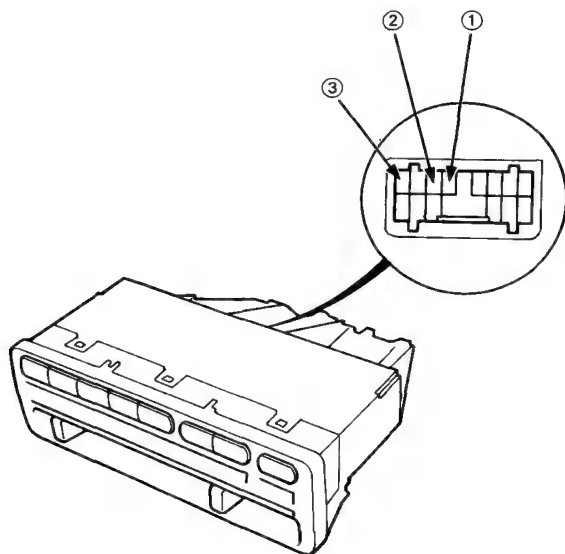


Test

A/C Switch

Check for continuity between the terminals according to the table below.

Terminal No. Position	①	②
ON		
OFF		



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If electrical maintenance is required)

Some model versions of the CIVIC include a driver's side airbag, located in the steering wheel hub, as part of a Supplemental Restraint System (SRS). Information necessary to safely service the SRS is included in this service manual. Items marked * on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special cautions and tools, and should therefore be done only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized Honda dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, can lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and the dashboard lower panel. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

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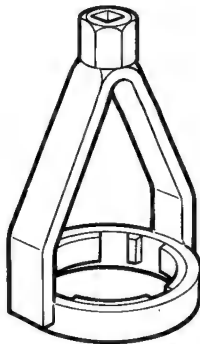
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*Before working in these areas, read the SRS precautions on page 23-334.

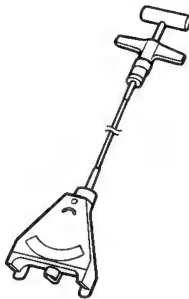


Special Tool

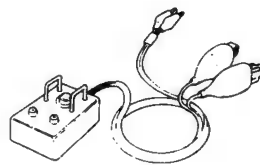
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07NAC-SR20100	Fuel Sender Wrench	1	23-161
②	07JGG-0010100	Belt Tension Gauge	1	23-138
③	07HAZ-SG00500	Deployment Tool	1	23-353
④	07MAZ-SS10100	SRS Disposal Bracket	1	23-352



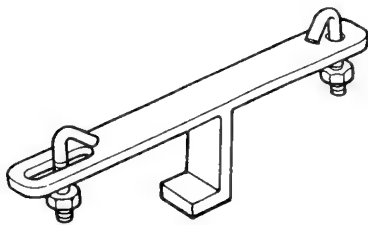
①



②



③



④

Troubleshooting



Tips and Precautions

Before Troubleshooting

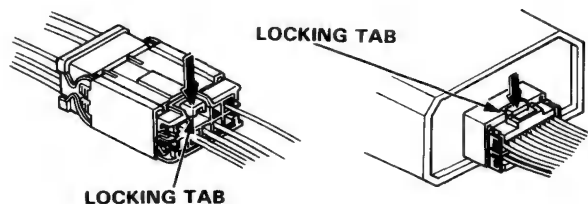
- Check applicable fuses in the appropriate fuse box.
- Check the battery for damage, state of charge, and clean and tight connections.
- Check the alternator belt tension.

CAUTION:

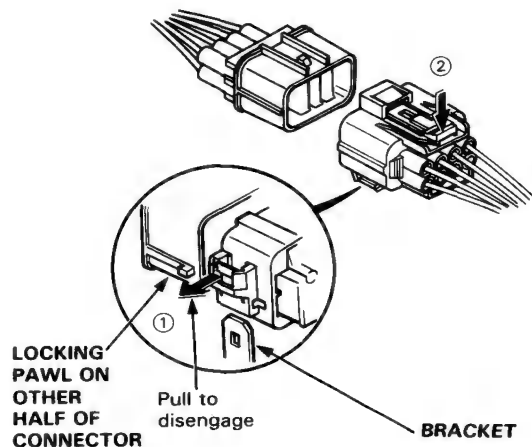
- Do not quick-charge a battery unless the battery ground cable has been disconnected. Otherwise you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

While you are working

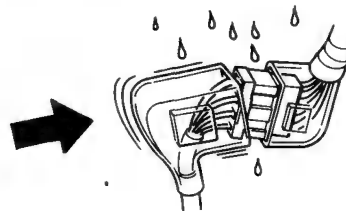
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks.



- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount.

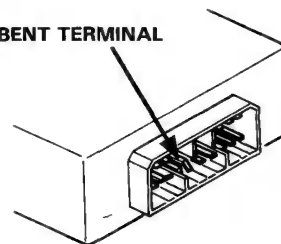


- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



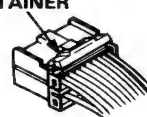
- Before connecting connectors, make sure the terminals are in place and not bent.

BENT TERMINAL



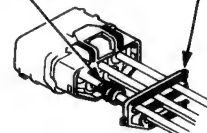
- Check for loose retainer and rubber seals.

RETAINER

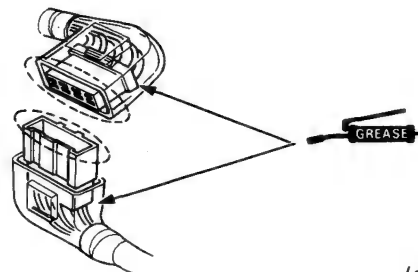


RUBBER SEAL

RETAINER



- The backs of some connectors are packed with grease. Add grease, if it's needed. If the grease is contaminated, replace it.

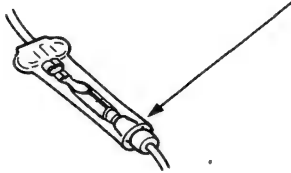


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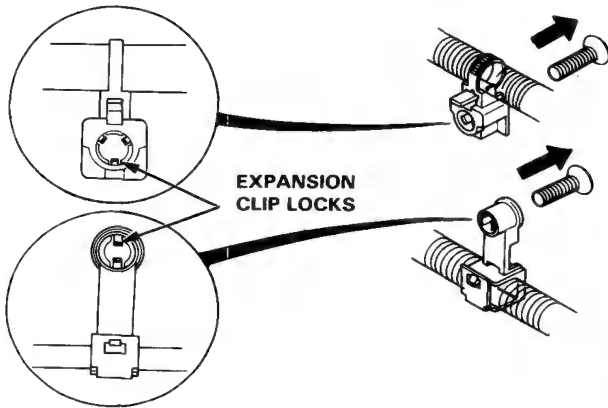
Troubleshooting

Tips and Precautions (cont'd)

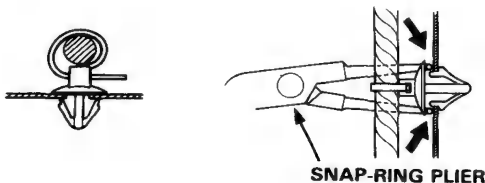
- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.



- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks.

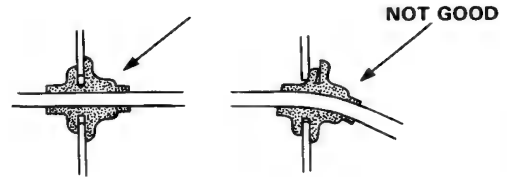


Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.

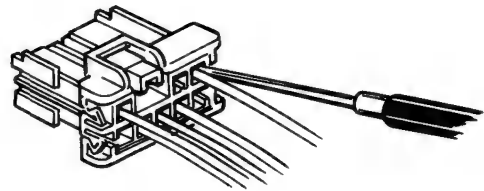


- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.

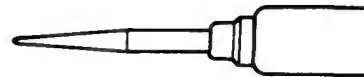
- Seat grommets in their grooves properly.



- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



Troubleshooting



Five-Step Troubleshooting

1. Verify The Complaint

Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic

Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit

Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

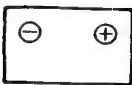



















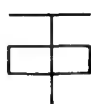
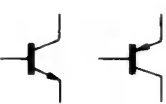
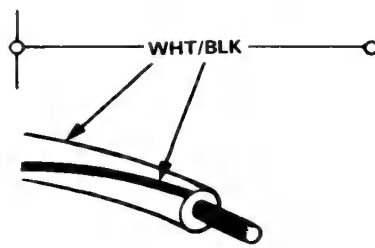
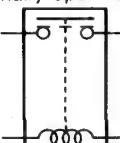
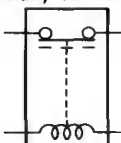



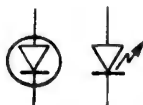



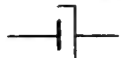

4. Fix The Problem

Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. Make Sure The Circuit Works

Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on that fuse. Make sure no new problems turn up and the original problem does not recur.

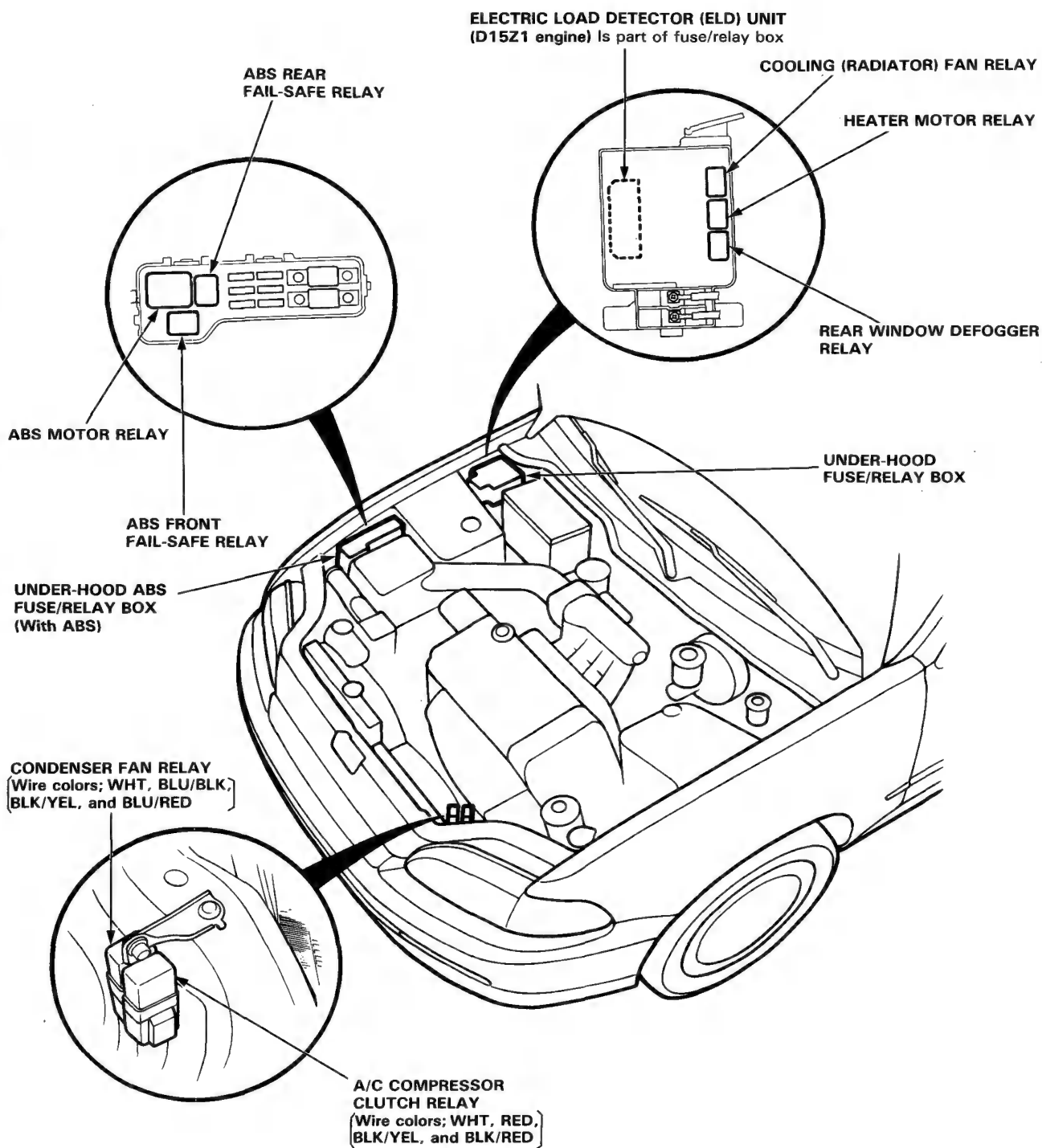
Schematic Symbols

SCHEMATIC SYMBOLS																															
BATTERY  or 	GROUND Ground terminal  Component ground 		FUSE 	COIL, SOLENOID 	CIGARETTE LIGHTER 																										
RESISTOR 	VARIABLE RESISTOR 	THERMISTOR 	IGNITION SWITCH 	BULB 	HEATER 																										
MOTOR 	PUMP 	CIRCUIT BREAKER 	HORN 	DIODE 	SPEAKER, BUZZER 																										
ANTENNA Mast  Window 		TRANSISTOR (Tr) 	Wire Color Codes <p>The following abbreviations are used to identify wire colors in the circuit schematics.</p> <table><tr><td>WHT</td><td>White</td></tr><tr><td>YEL</td><td>Yellow</td></tr><tr><td>BLK</td><td>Black</td></tr><tr><td>BLU</td><td>Blue</td></tr><tr><td>GRN</td><td>Green</td></tr><tr><td>RED</td><td>Red</td></tr><tr><td>ORN</td><td>Orange</td></tr><tr><td>PNK</td><td>Pink</td></tr><tr><td>BRN</td><td>Brown</td></tr><tr><td>GRY</td><td>Gray</td></tr><tr><td>PUR</td><td>Purple</td></tr><tr><td>LT BLU</td><td>Light Blue</td></tr><tr><td>LT GRN</td><td>Light Green</td></tr></table> <p>Wire insulator has one color or one color with another color stripe. The second color is the stripe.</p> 			WHT	White	YEL	Yellow	BLK	Black	BLU	Blue	GRN	Green	RED	Red	ORN	Orange	PNK	Pink	BRN	Brown	GRY	Gray	PUR	Purple	LT BLU	Light Blue	LT GRN	Light Green
WHT	White																														
YEL	Yellow																														
BLK	Black																														
BLU	Blue																														
GRN	Green																														
RED	Red																														
ORN	Orange																														
PNK	Pink																														
BRN	Brown																														
GRY	Gray																														
PUR	Purple																														
LT BLU	Light Blue																														
LT GRN	Light Green																														
RELAY (In normal position) Normally open relay  Normally closed relay 		CONDENSER 																													
SWITCH (In normal position) Normally open switch  Normally closed switch 		LUMINOUS DIODE (LED) 																													
CONNECTION Input  Output 	CONNECTOR Male  Female 	REED SWITCH 																													



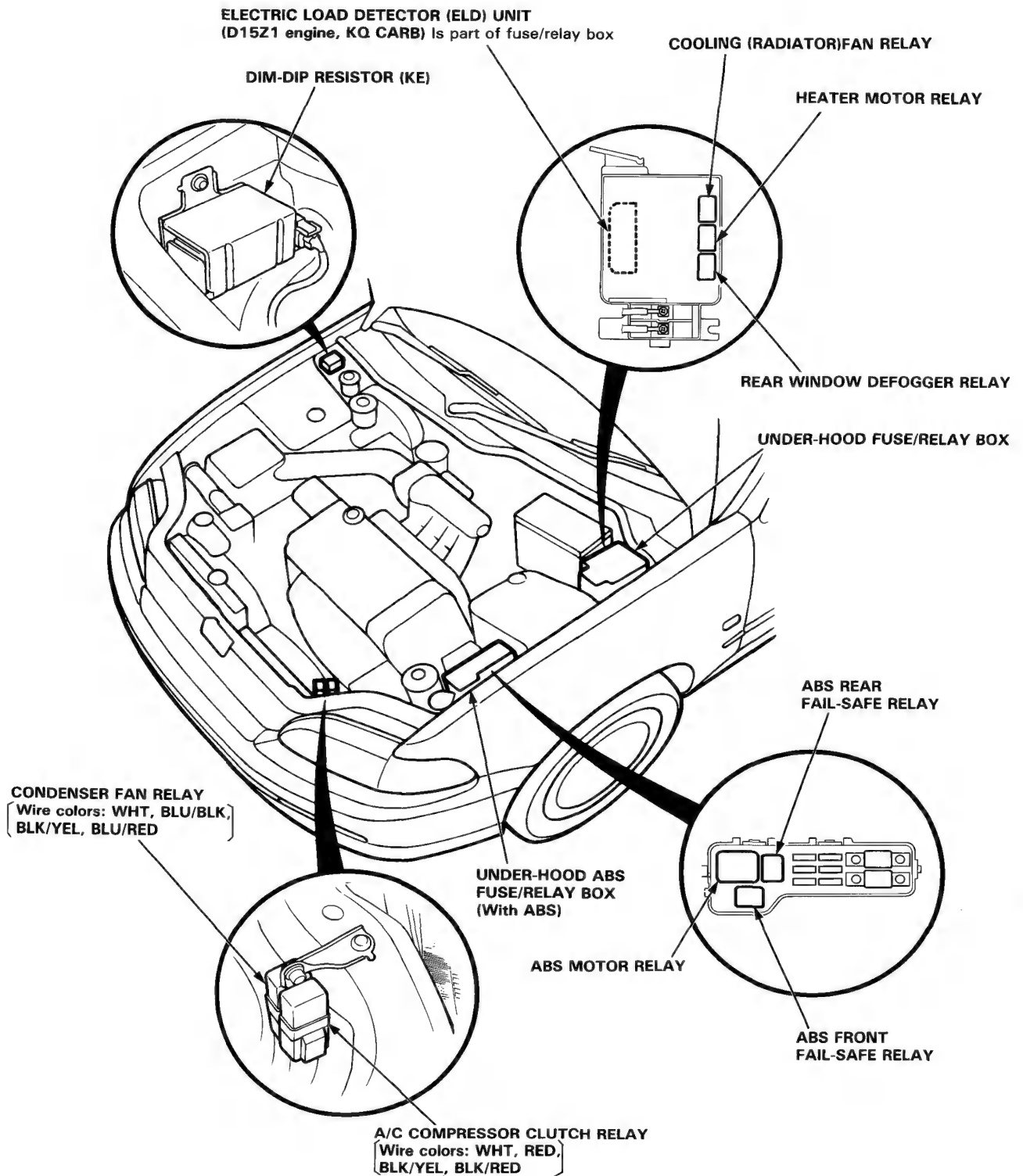
Relay and Control Unit Locations

Engine Compartment (LHD)



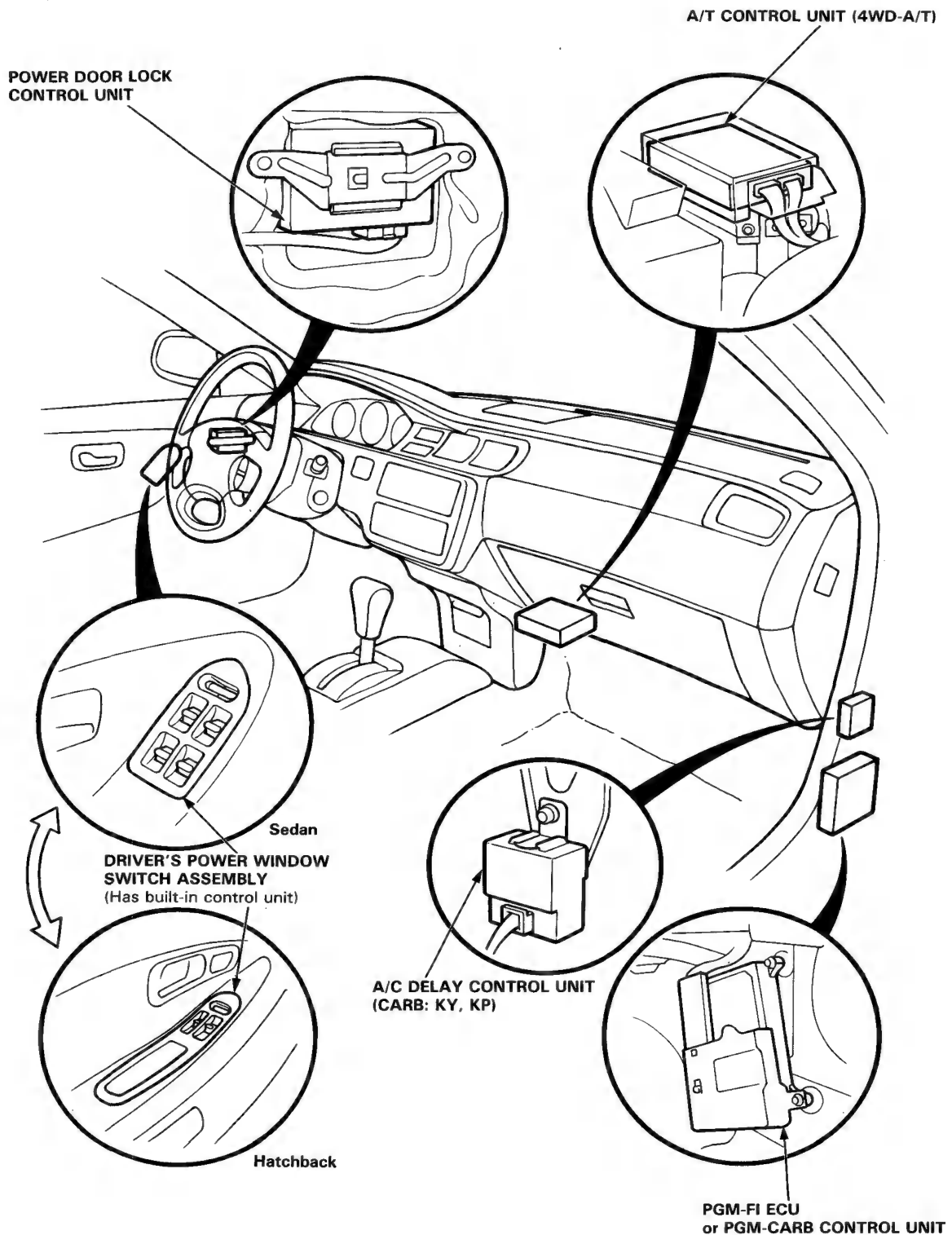


Engine Compartment (RHD)



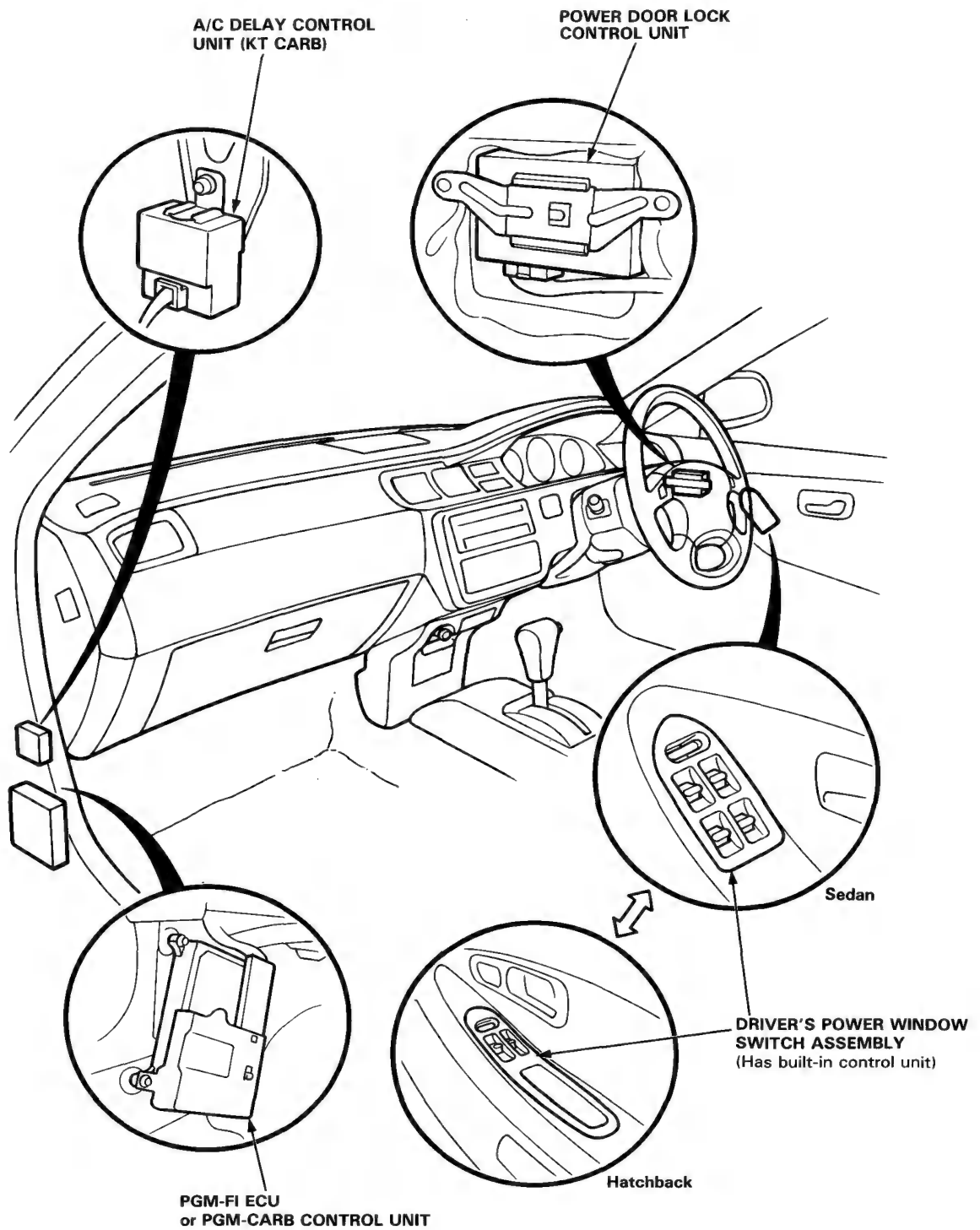
Relay and Control Unit Locations

Dashboard (LHD)



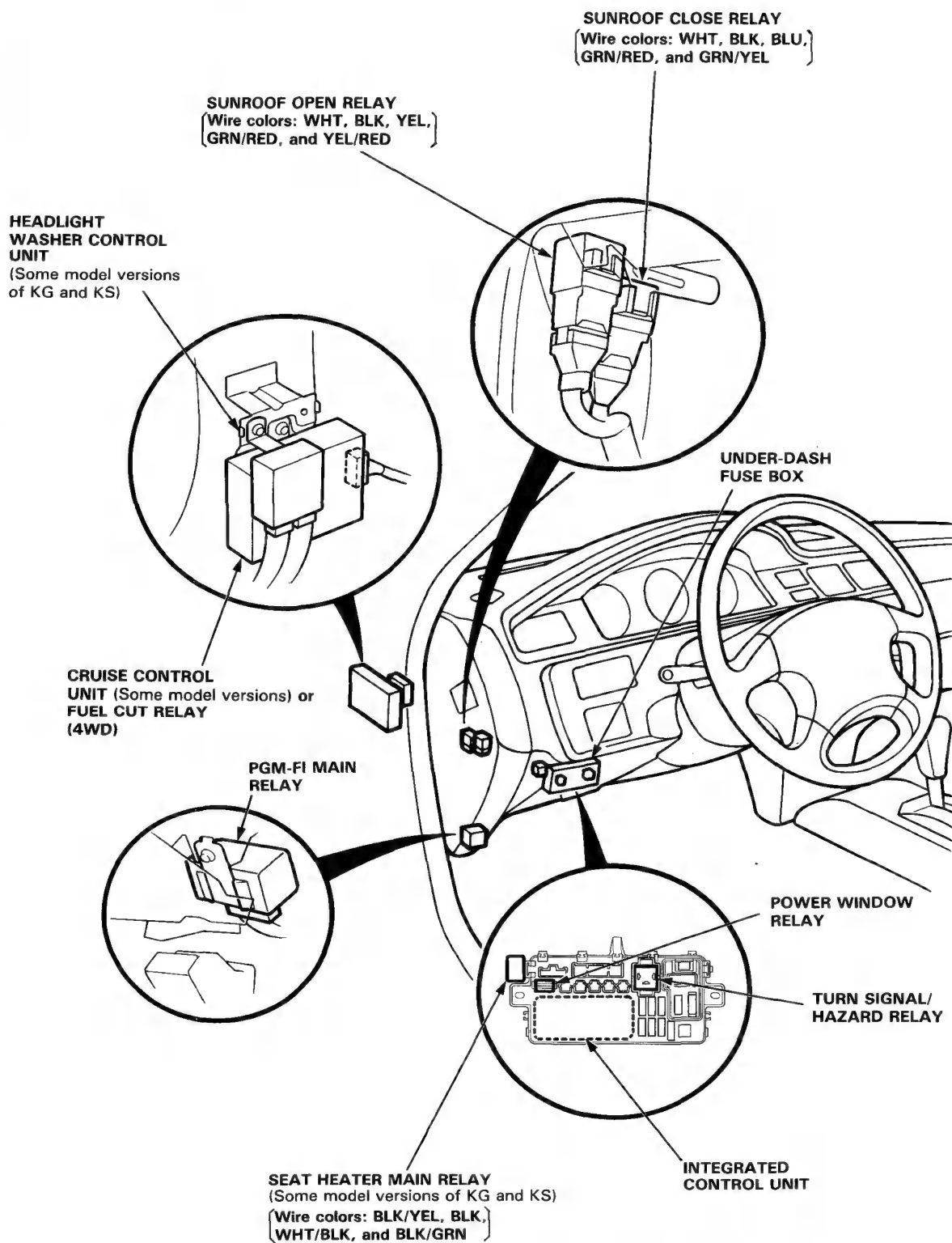


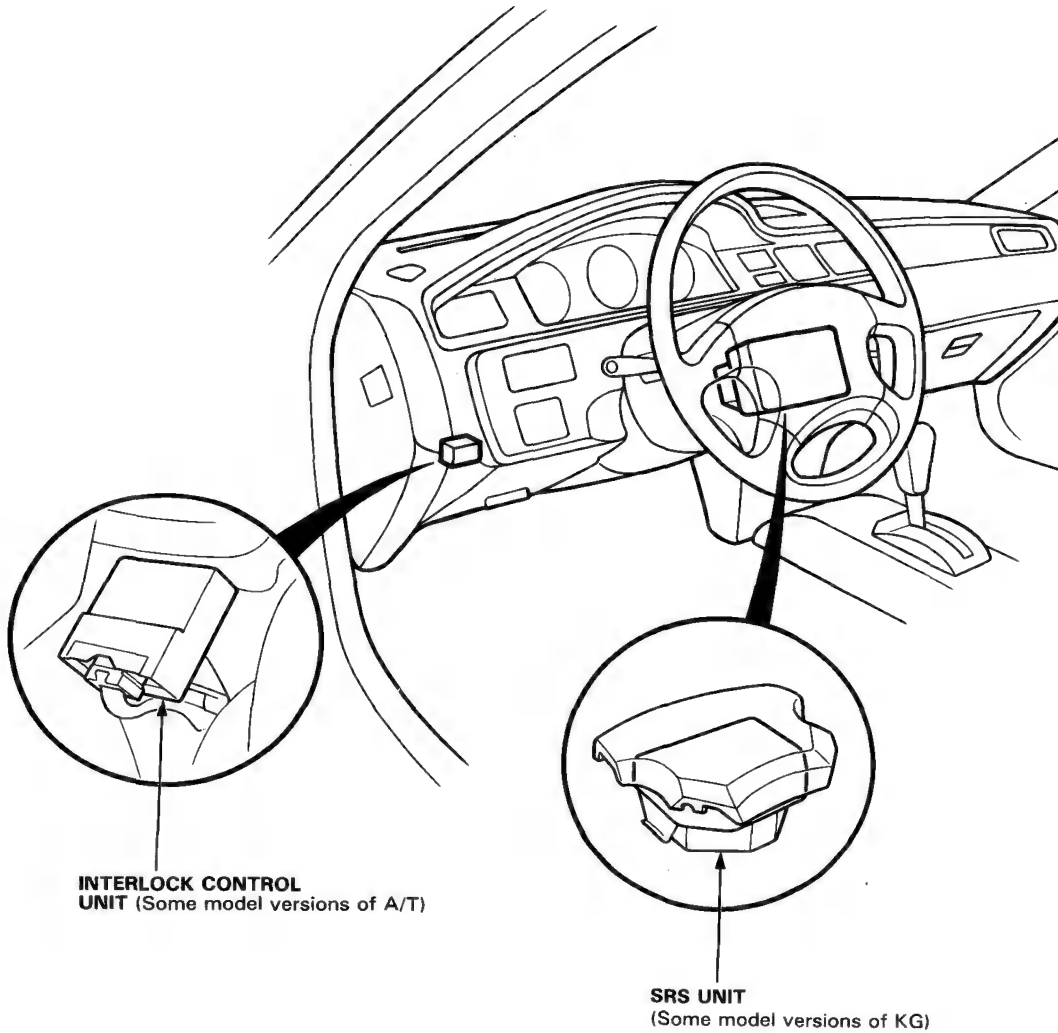
Dashboard (RHD)



Relay and Control Unit Locations

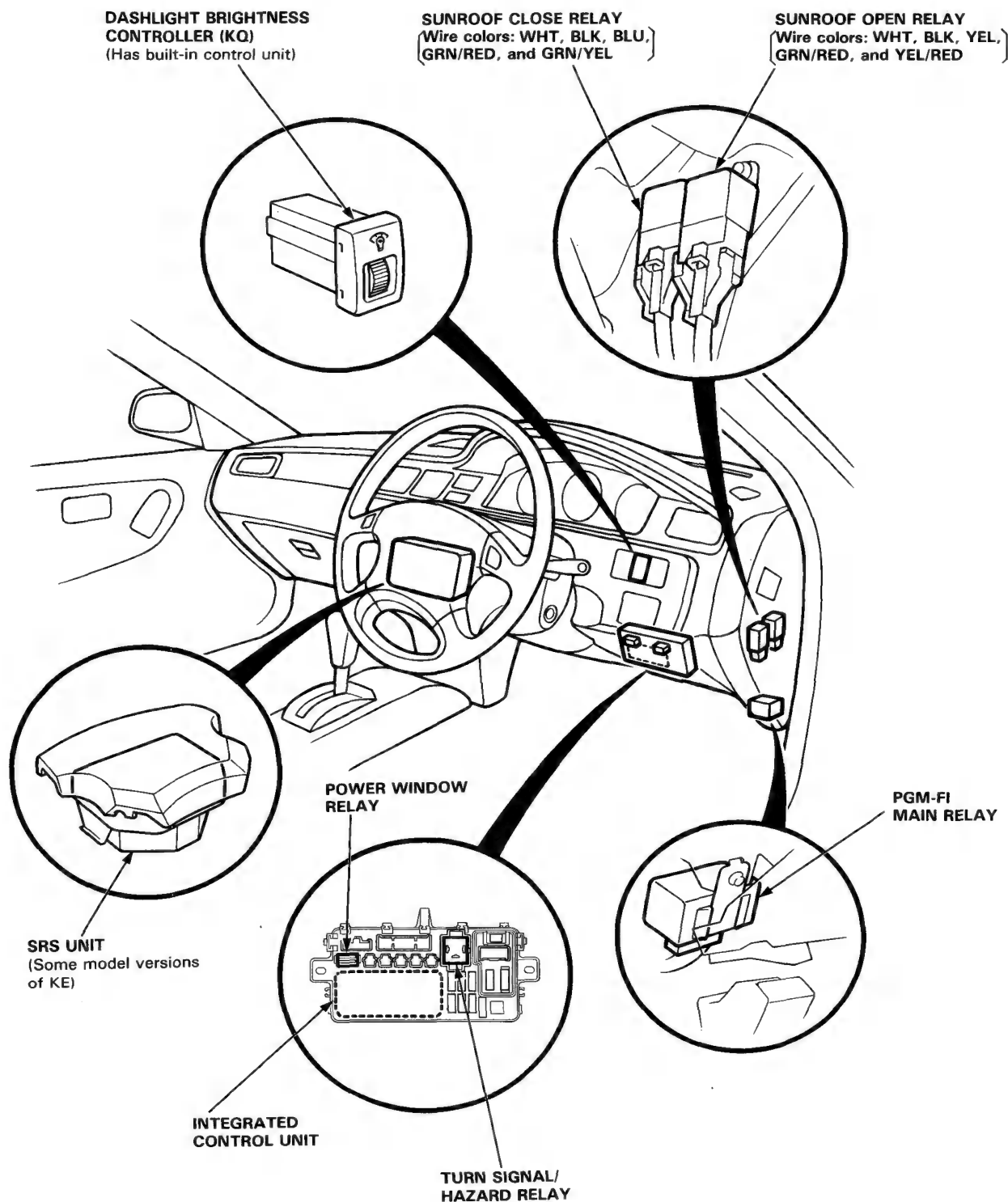
Dashboard (LHD)





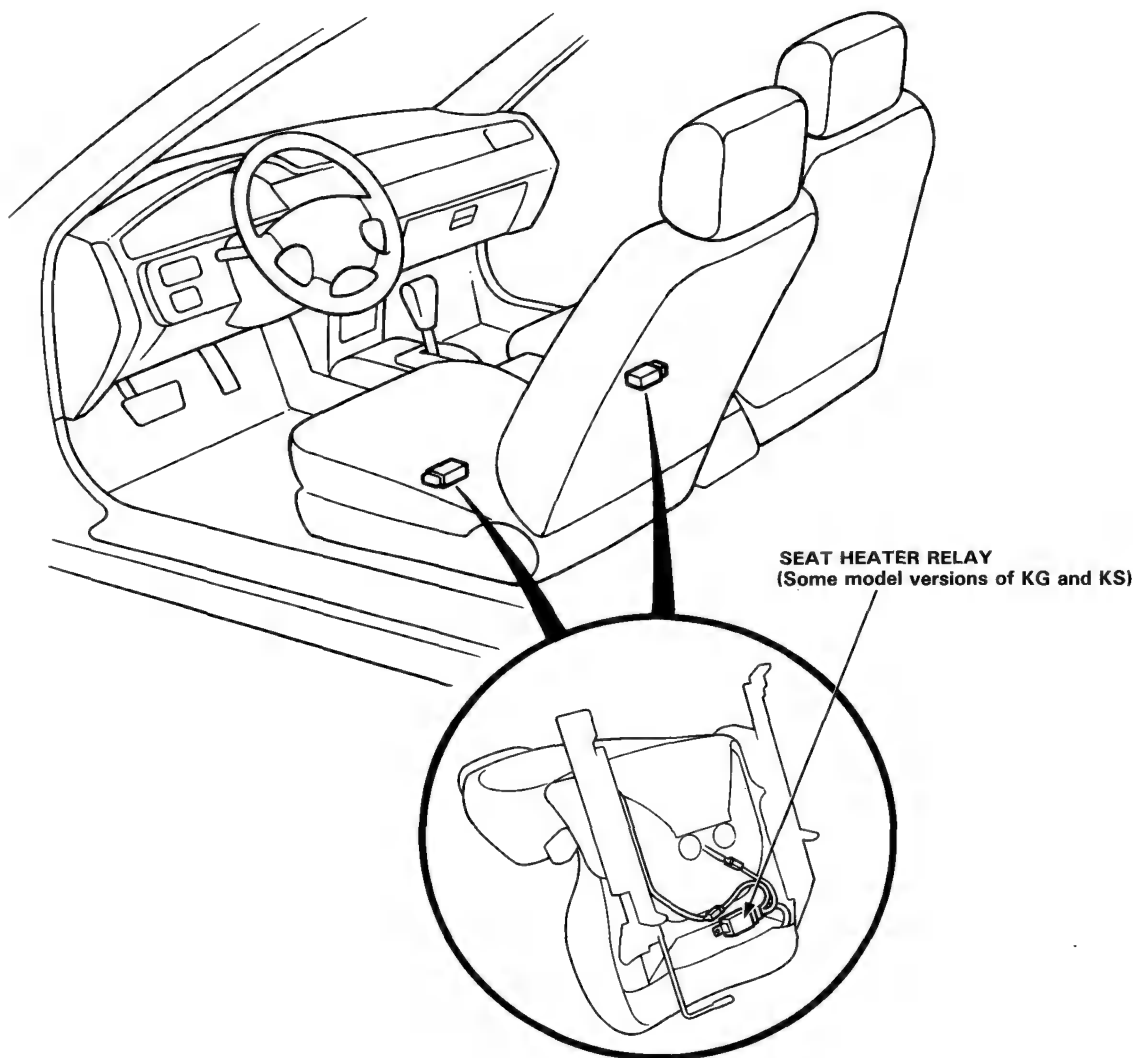
Relay and Control Unit Locations

Dashboard (RHD)





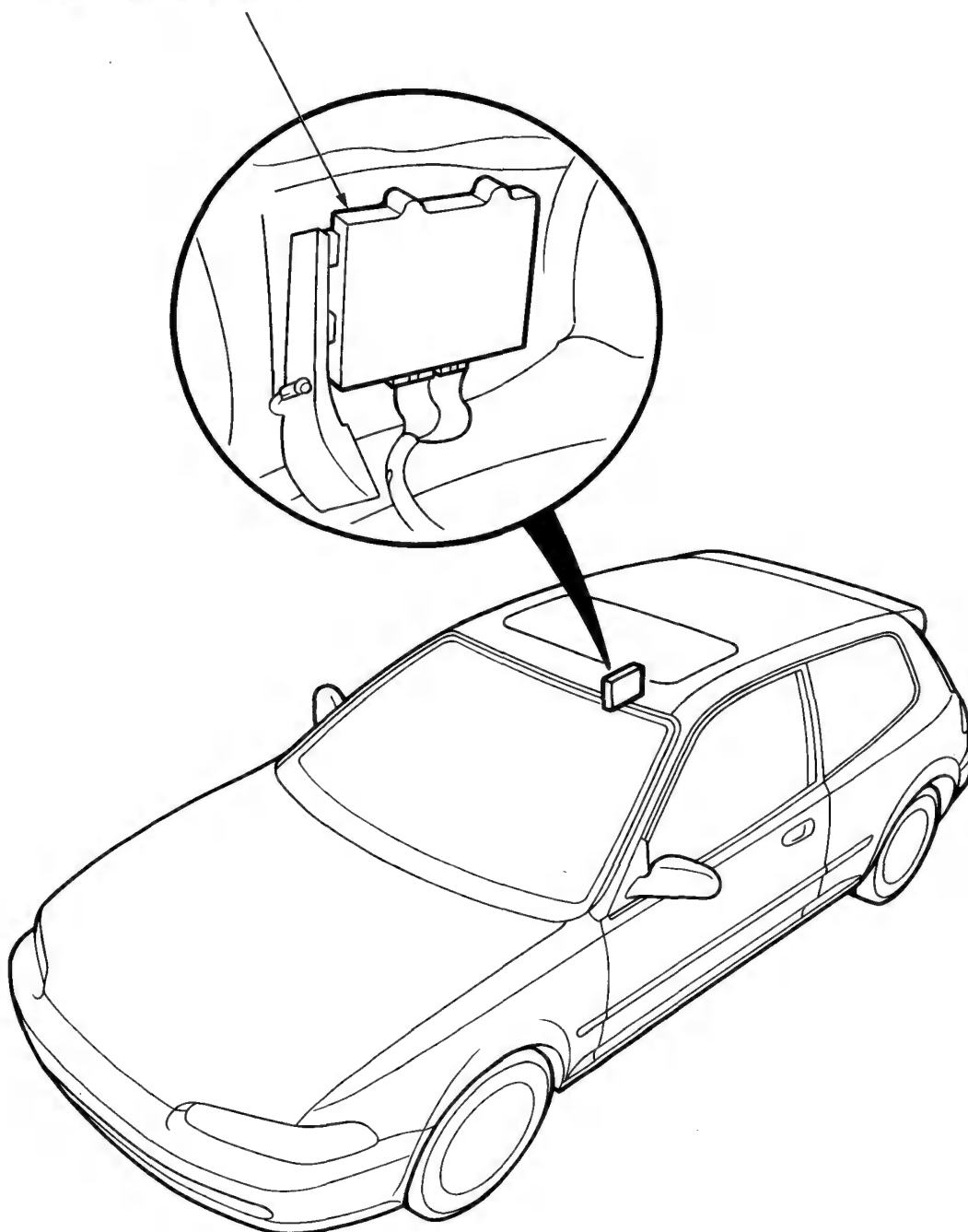
Seat



Relay and Control Unit Locations

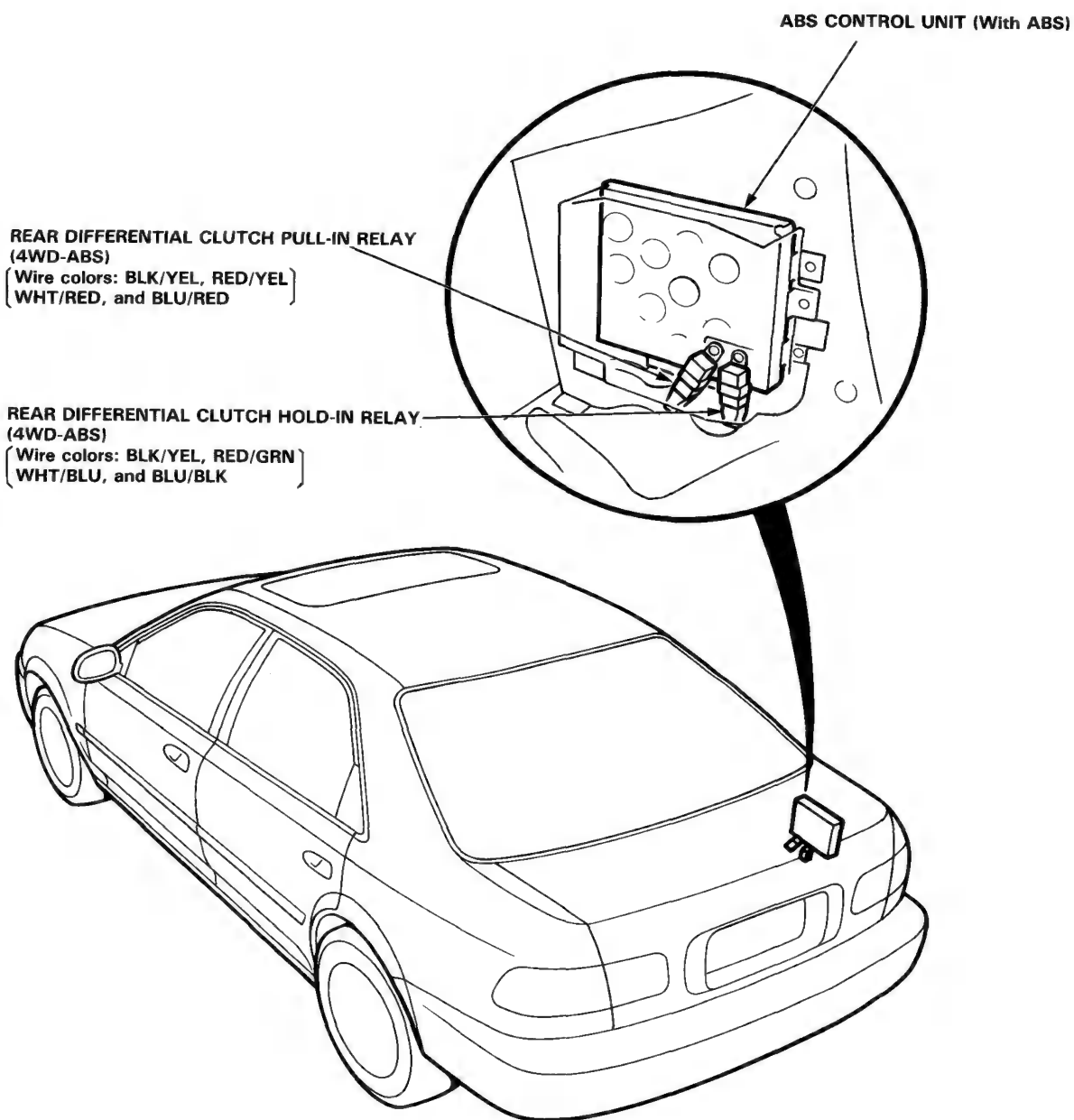
Cargo Area (Hatchback)

ABS CONTROL UNIT (With ABS)



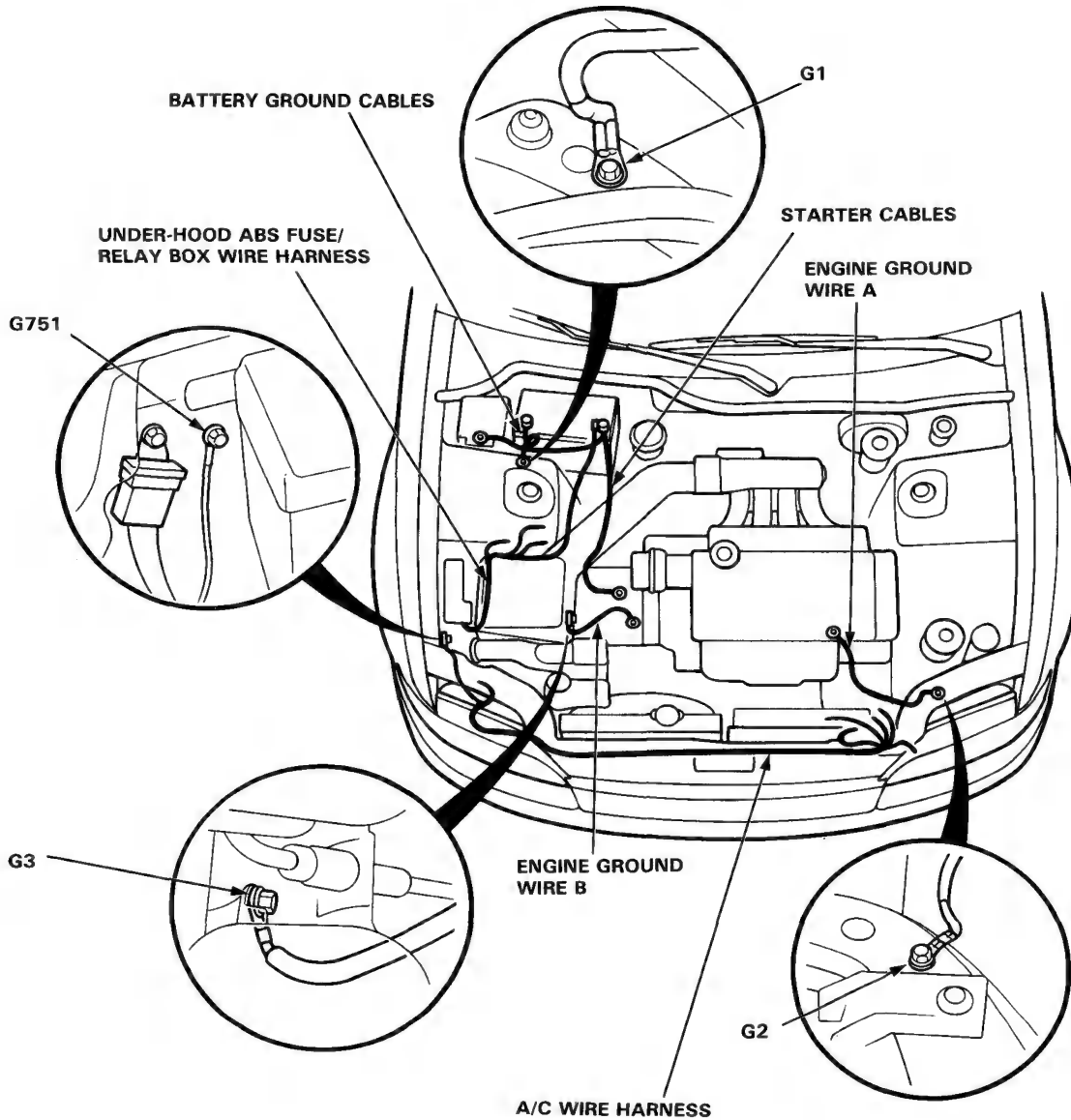


Trunk (Sedan)



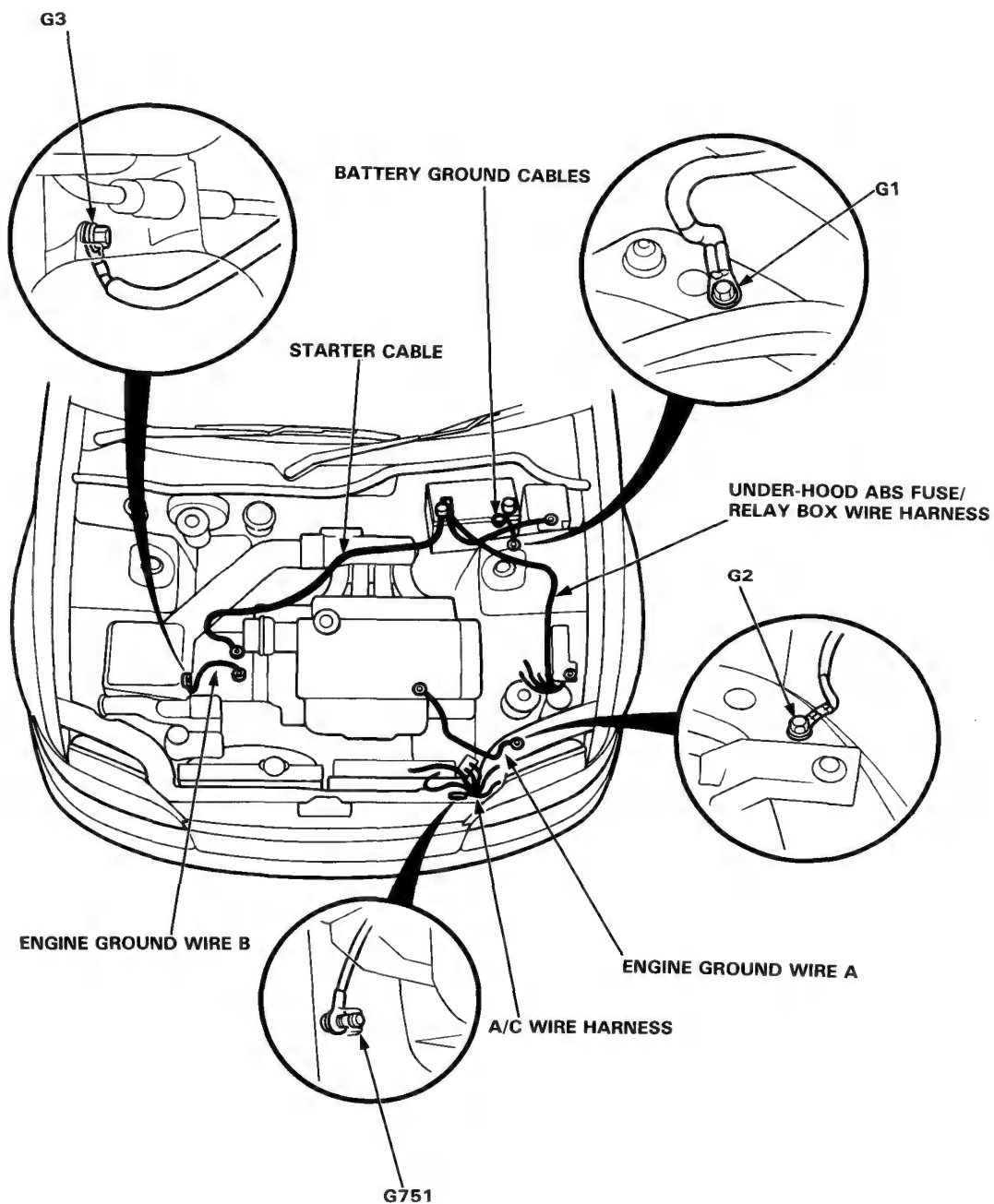
Wire Harness and Ground Locations

Engine Compartment (LHD)





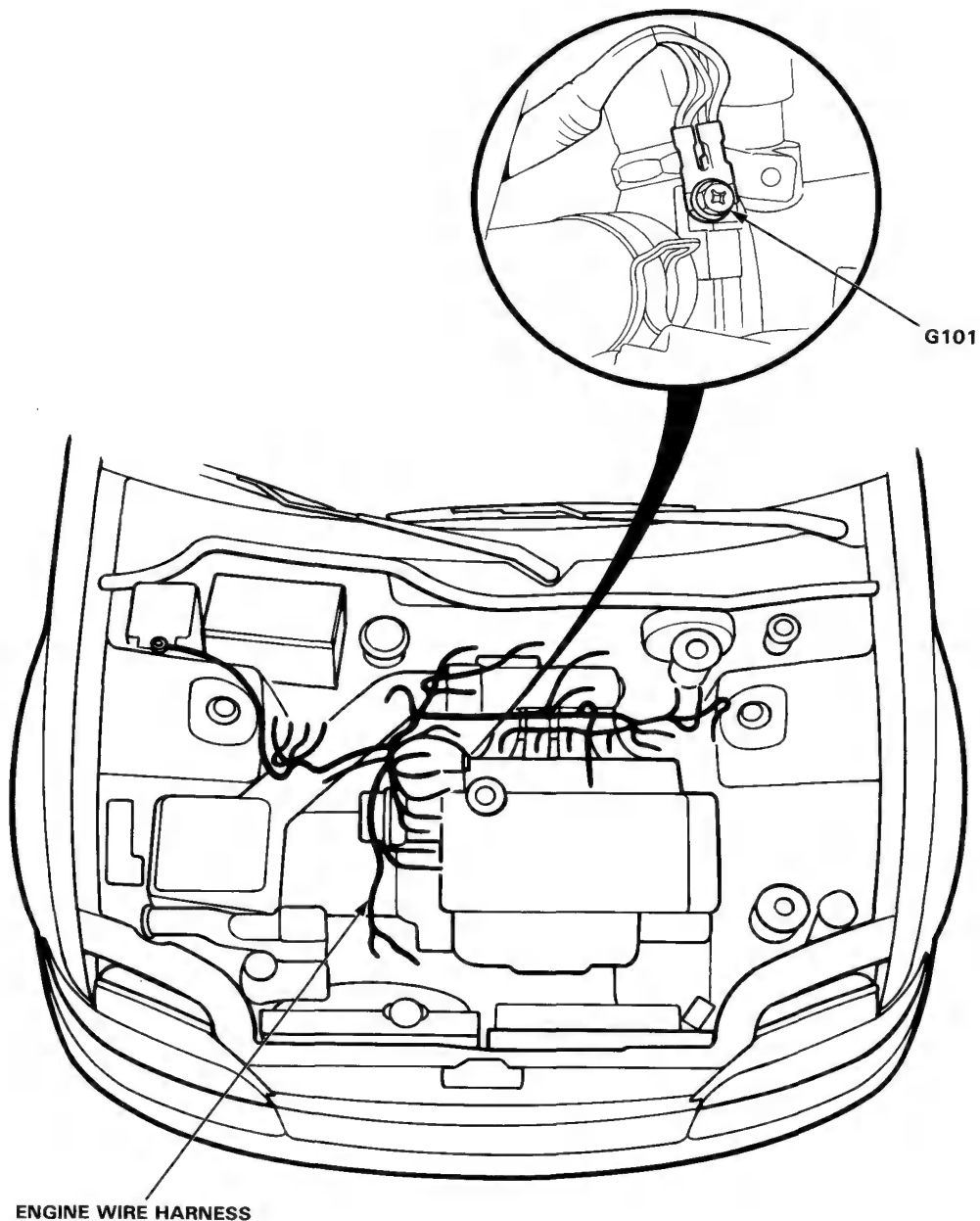
Engine Compartment (RHD)



Wire Harness and Ground Locations

Engine Compartment (Fuel-Injected Engine)

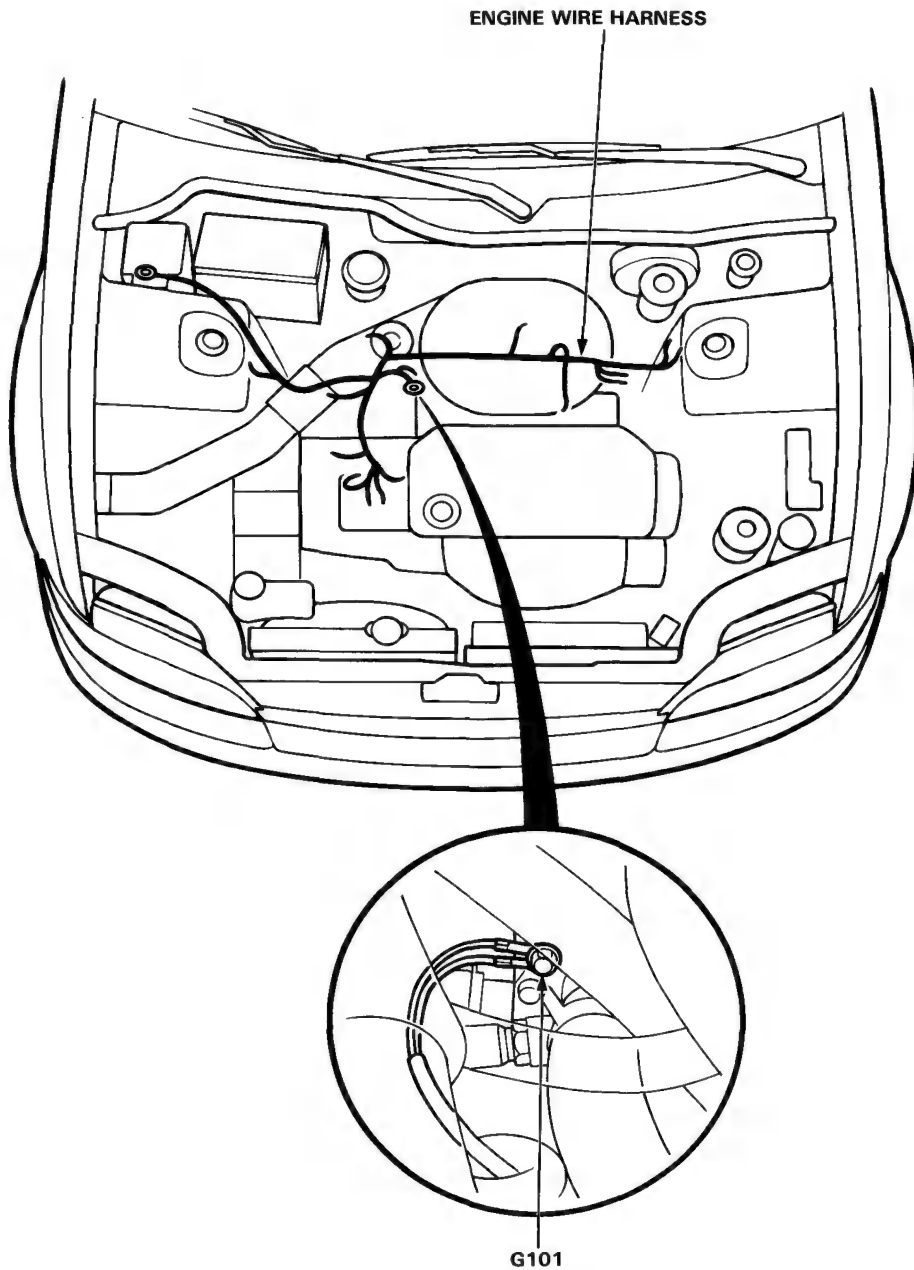
NOTE: LHD type is shown; RHD type is symmetrical.





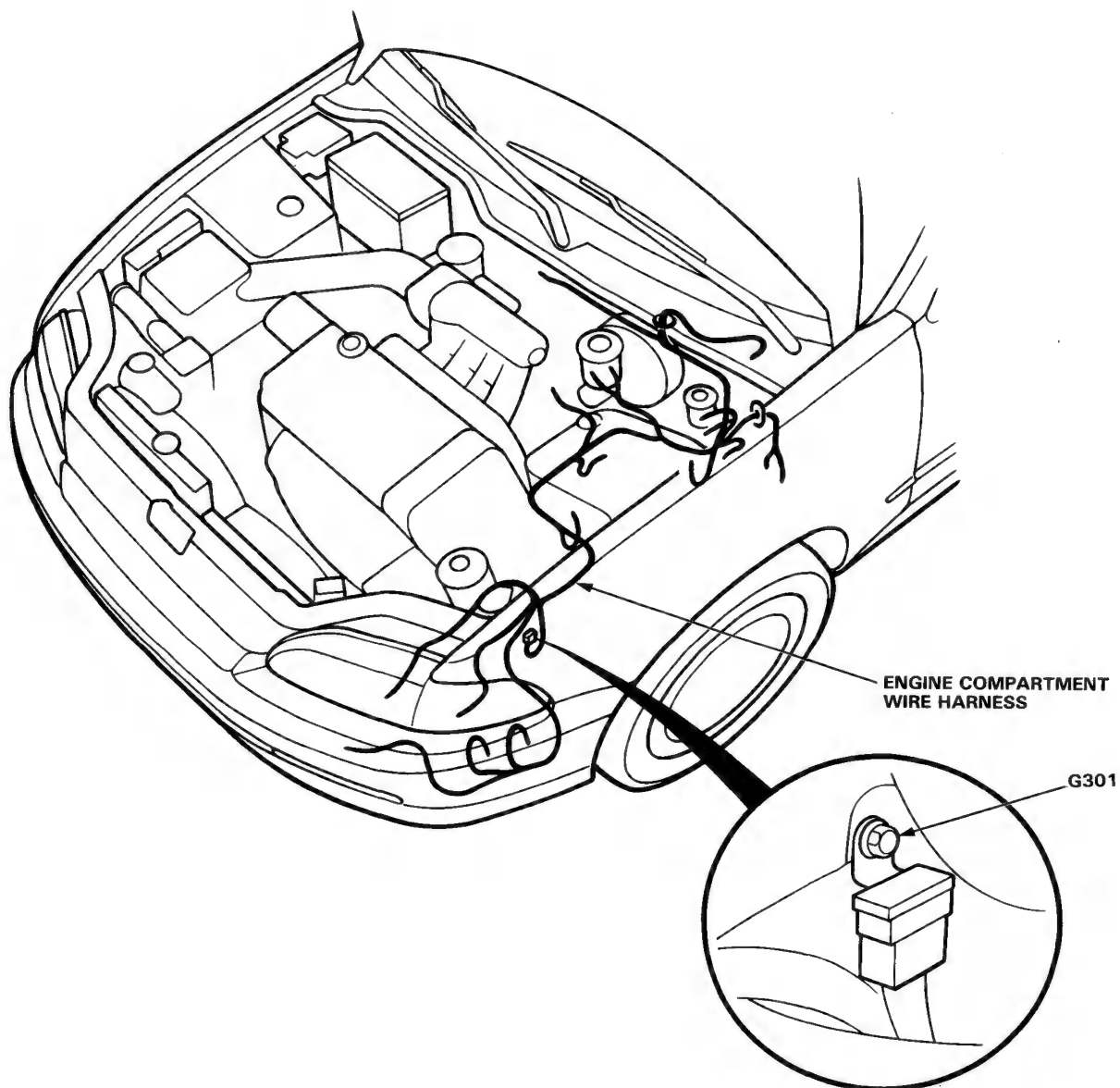
Engine Compartment (Carbureted Engine)

NOTE: LHD type is shown; RHD type is symmetrical.



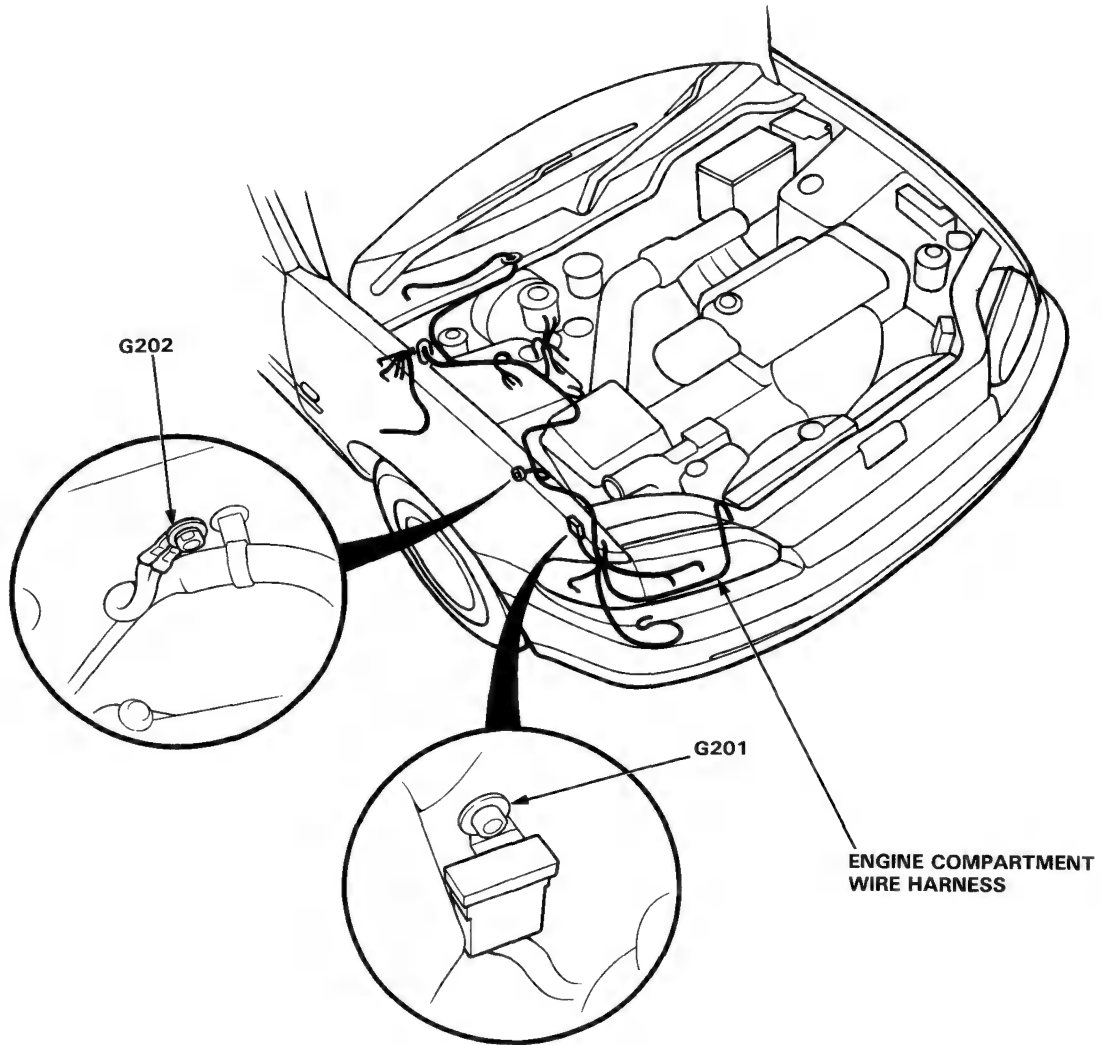
Wire Harness and Ground Locations

Engine Compartment (LHD)





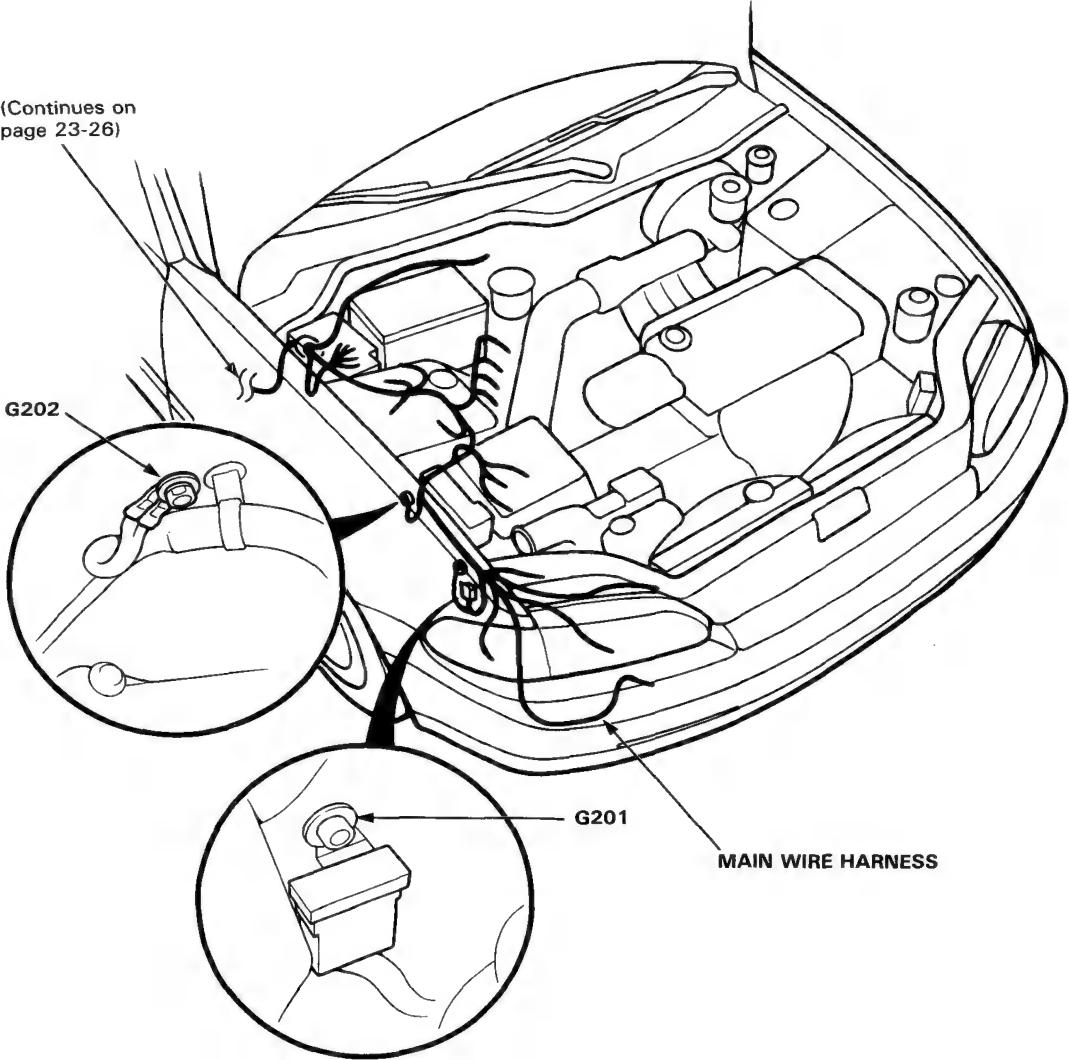
Engine Compartment (RHD)



Wire Harness and Ground Locations

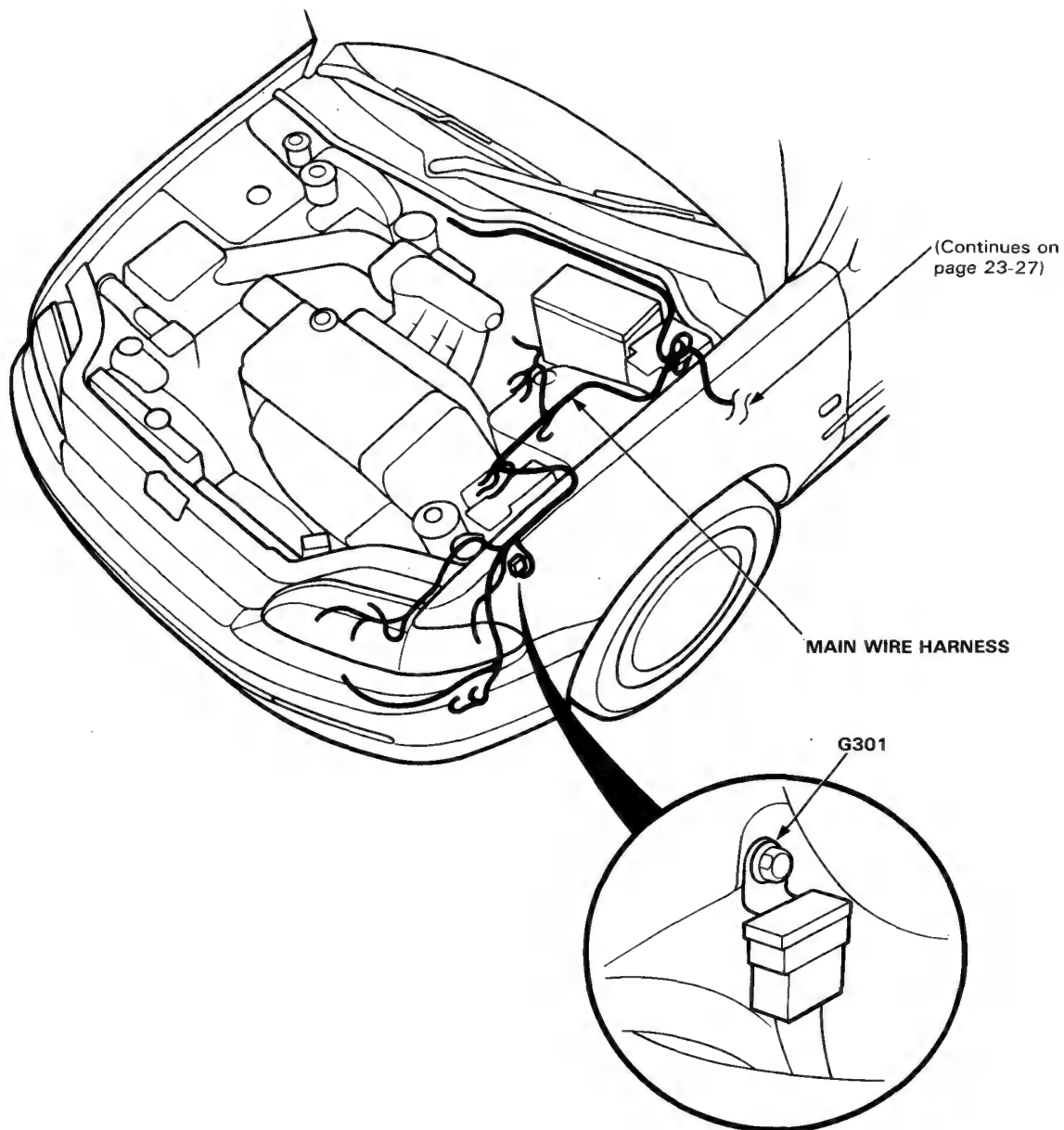
Engine Compartment (LHD)

(Continues on
page 23-26)



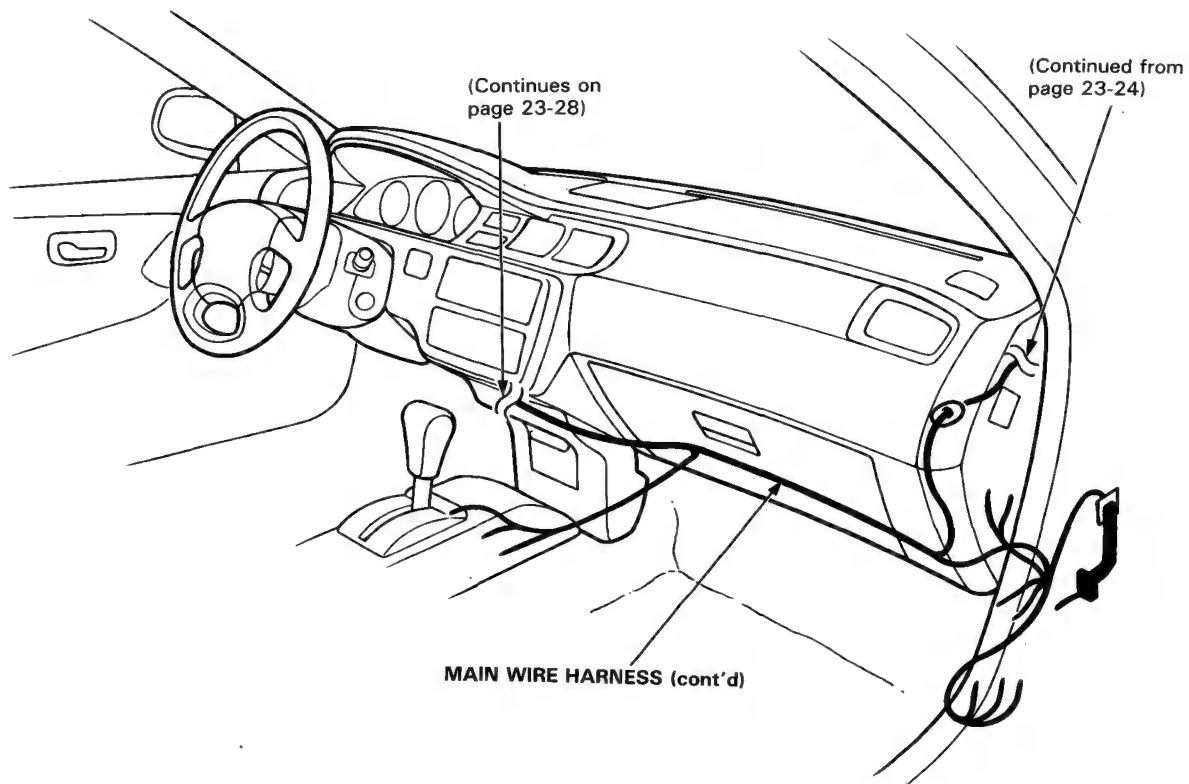


Engine Compartment (RHD)



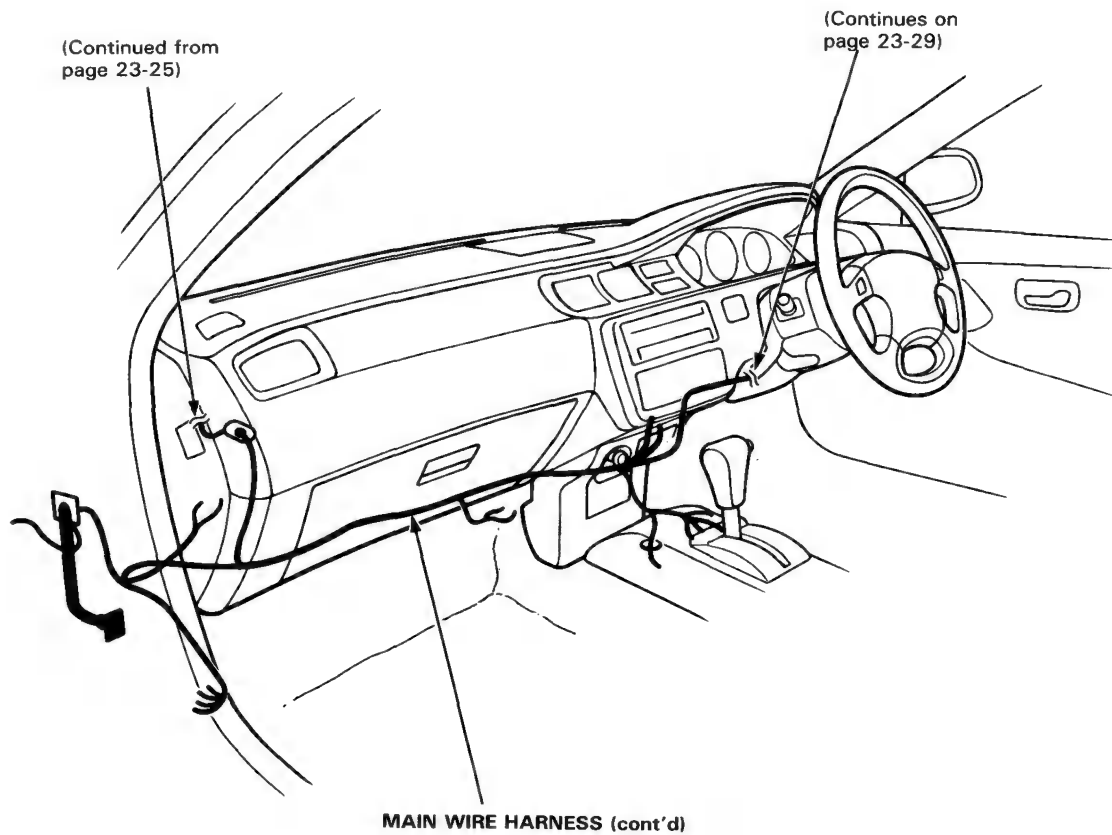
Wire Harness and Ground Locations

Dashboard and Floor (LHD)



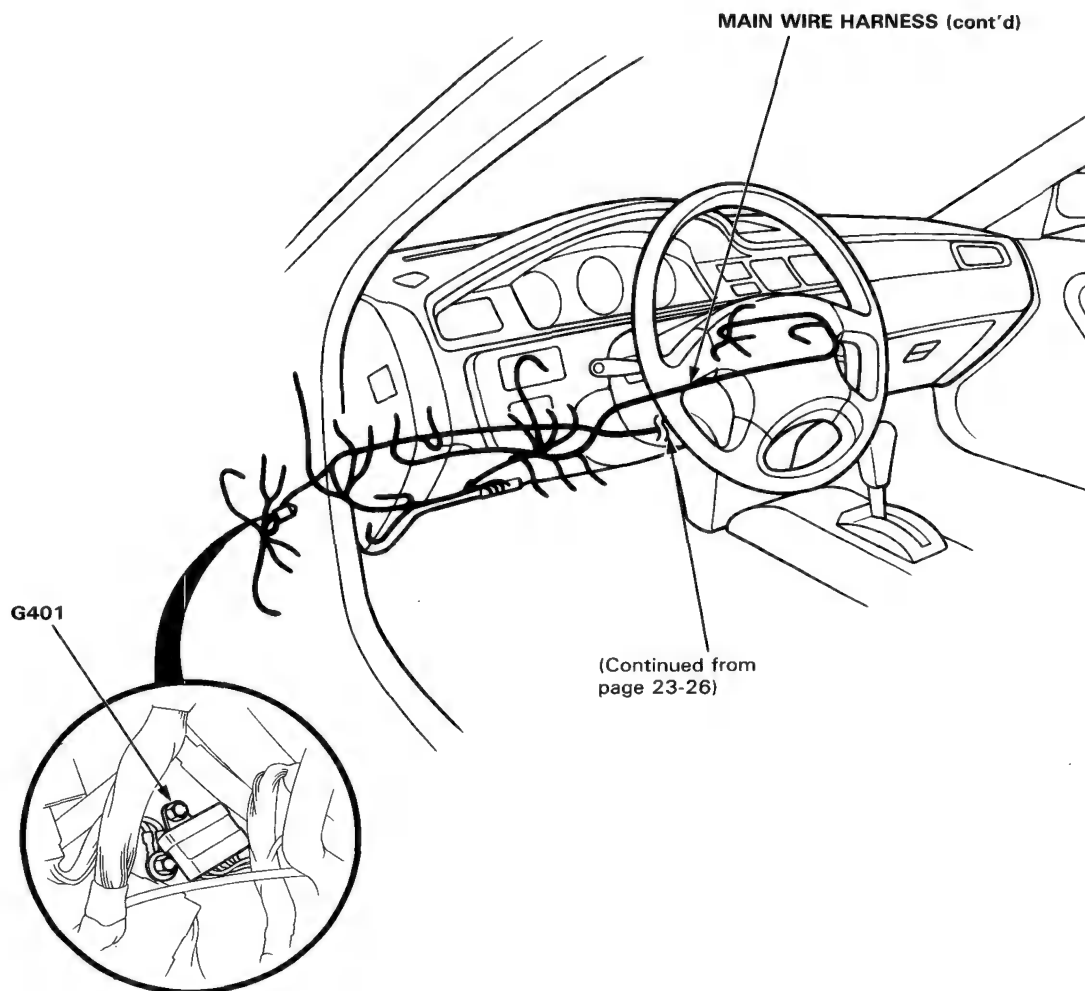


Dashboard and Floor (RHD)



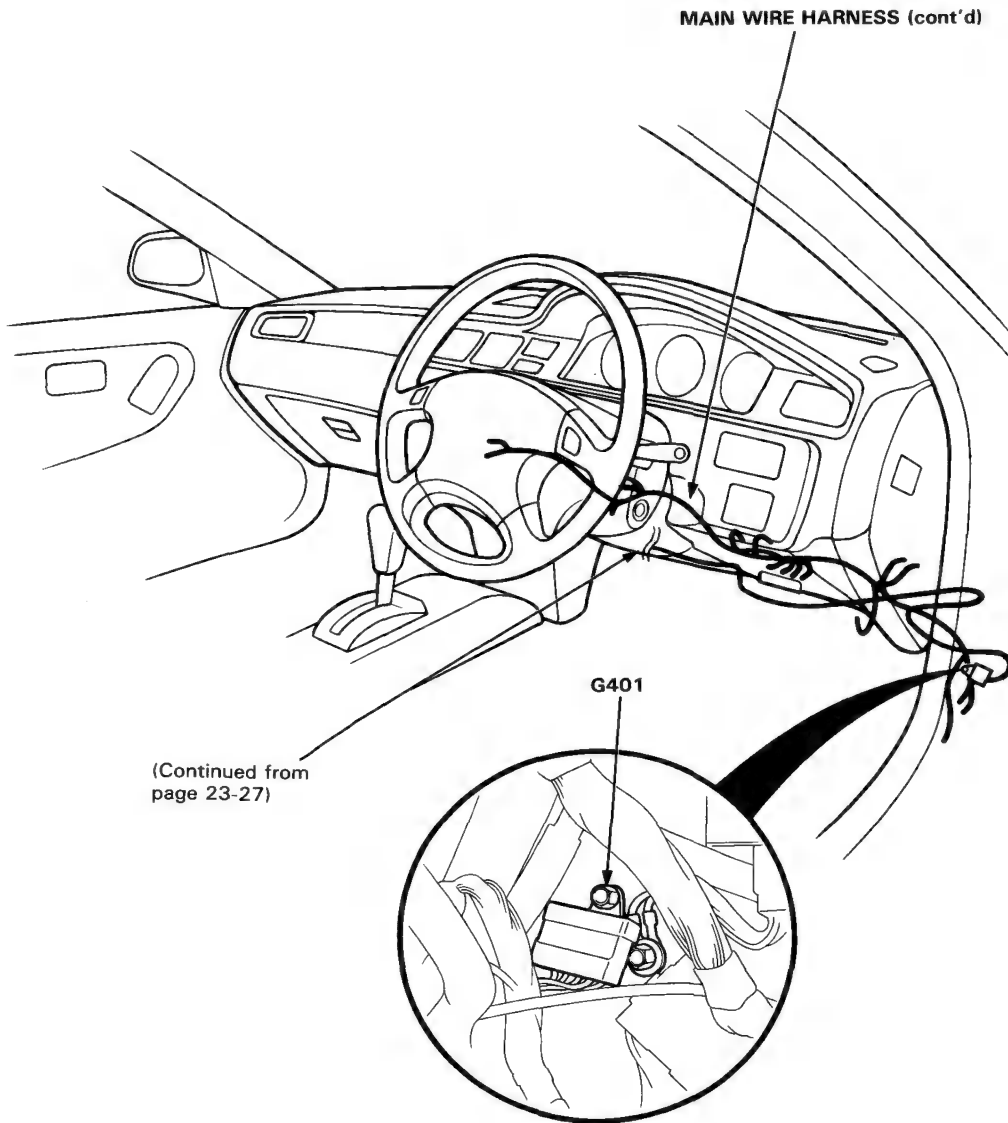
Wire Harness and Ground Locations

Dashboard (LHD)





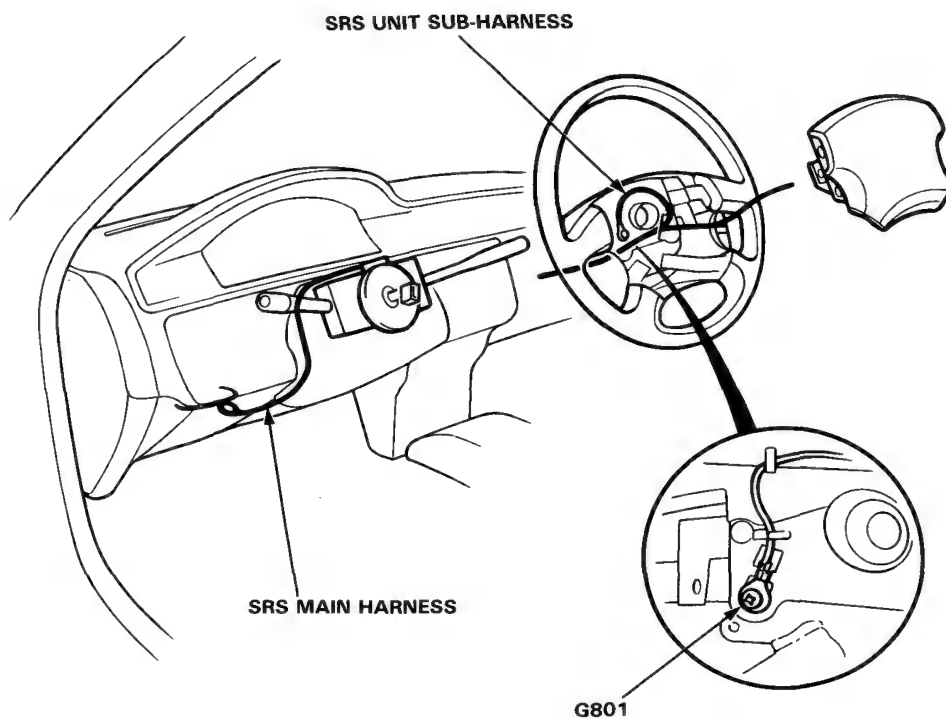
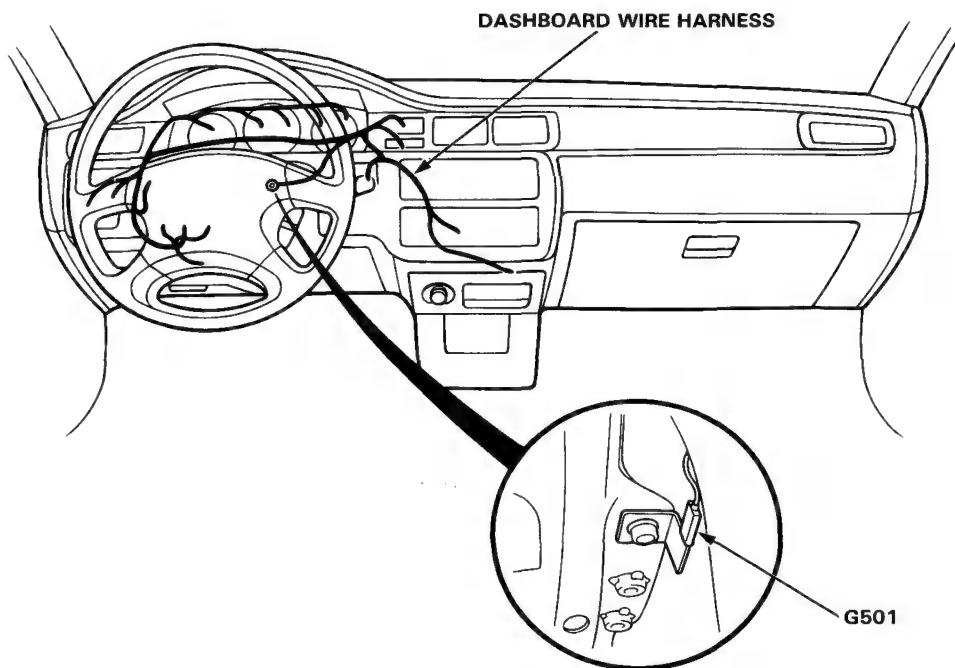
Dashboard (RHD)

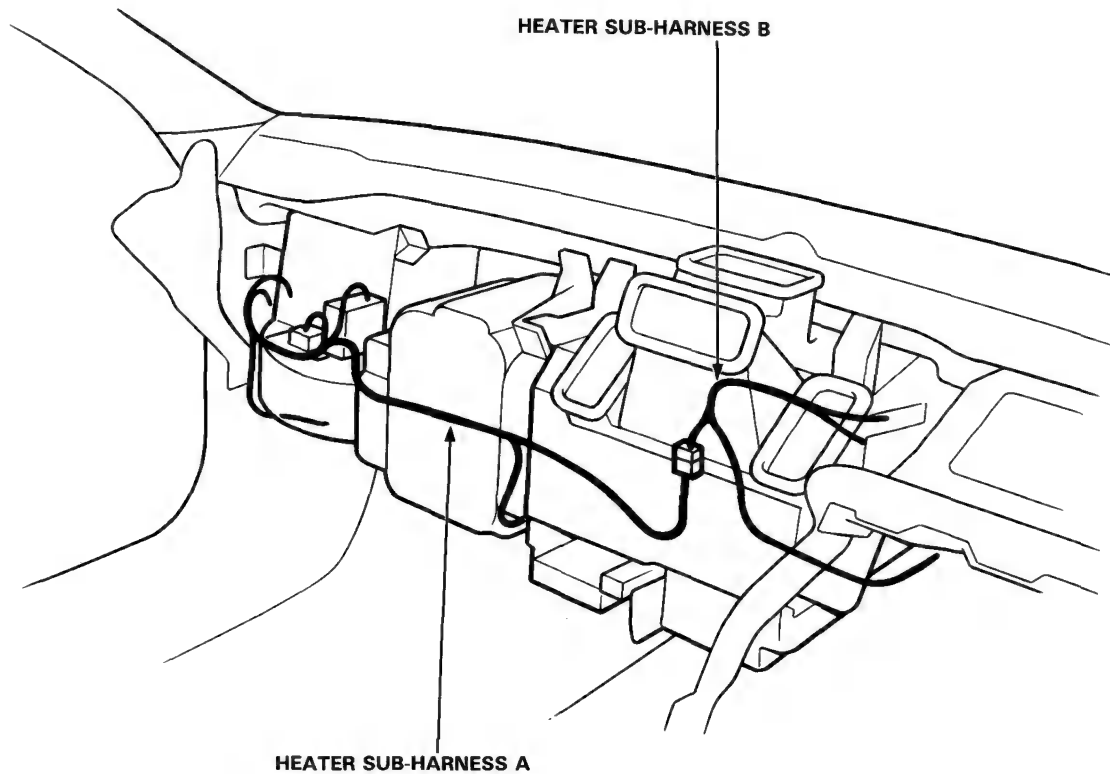


Wire Harness and Ground Locations

Dashboard

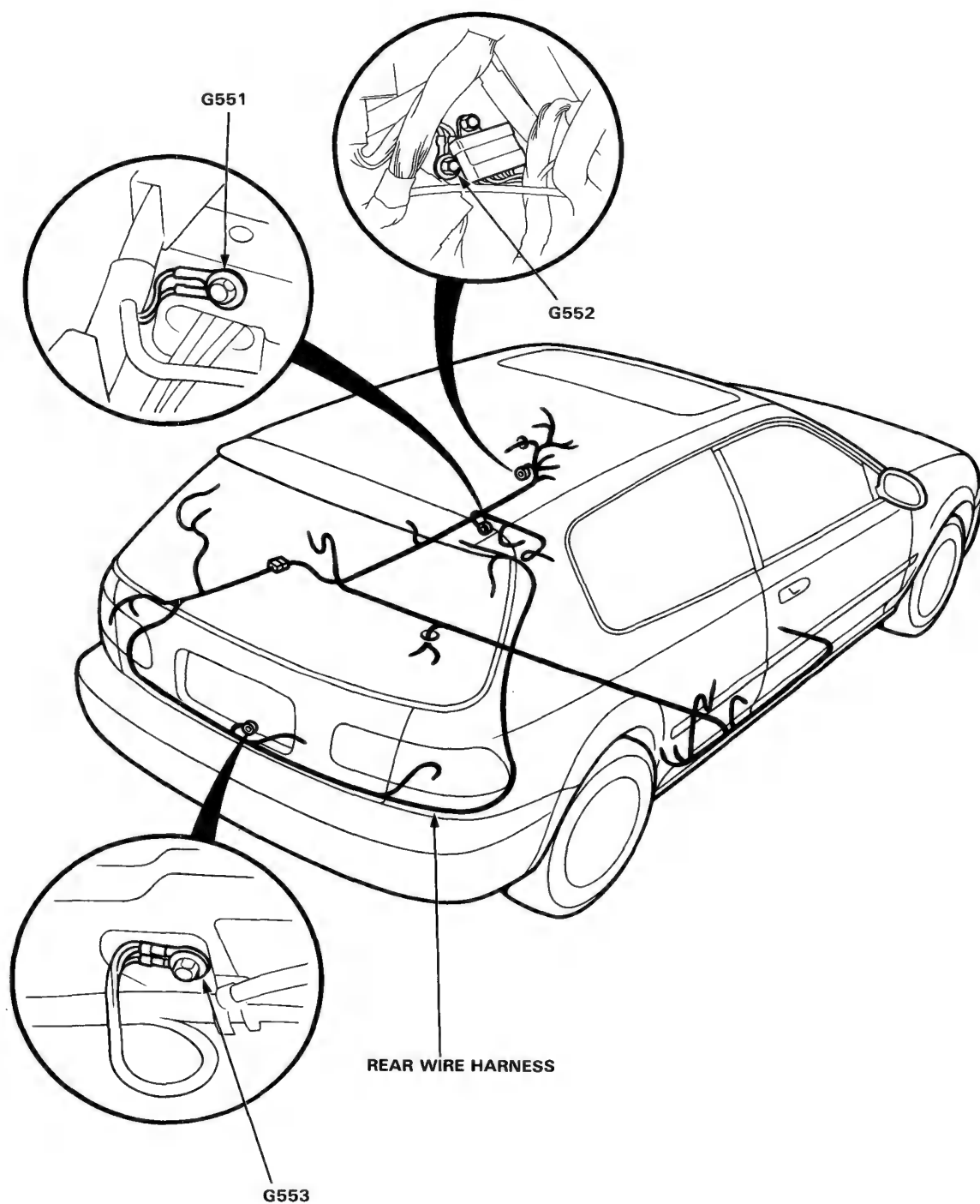
NOTE: LHD type is shown; RHD type is symmetrical.

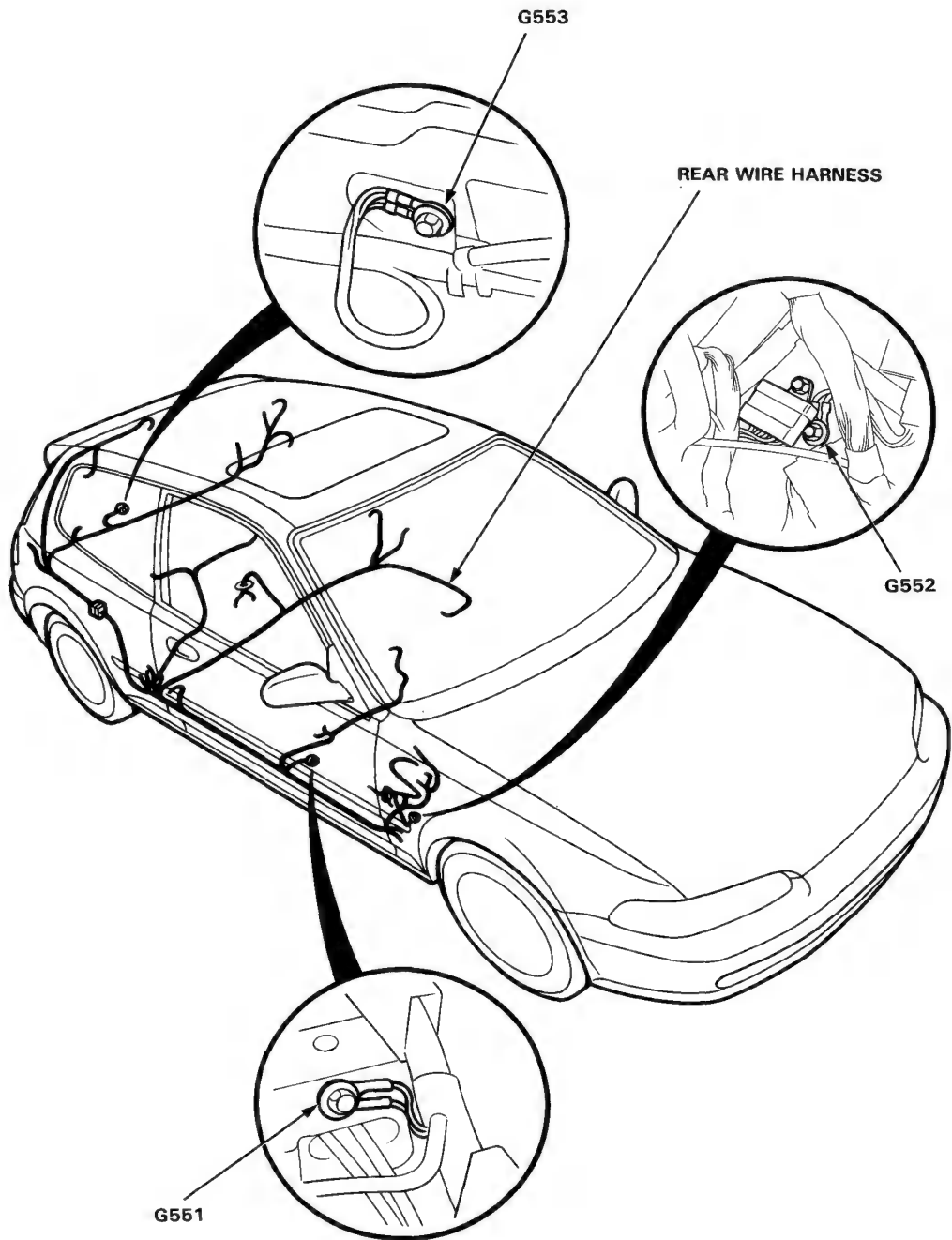




Wire Harness and Ground Locations

Floor (Hatchback)

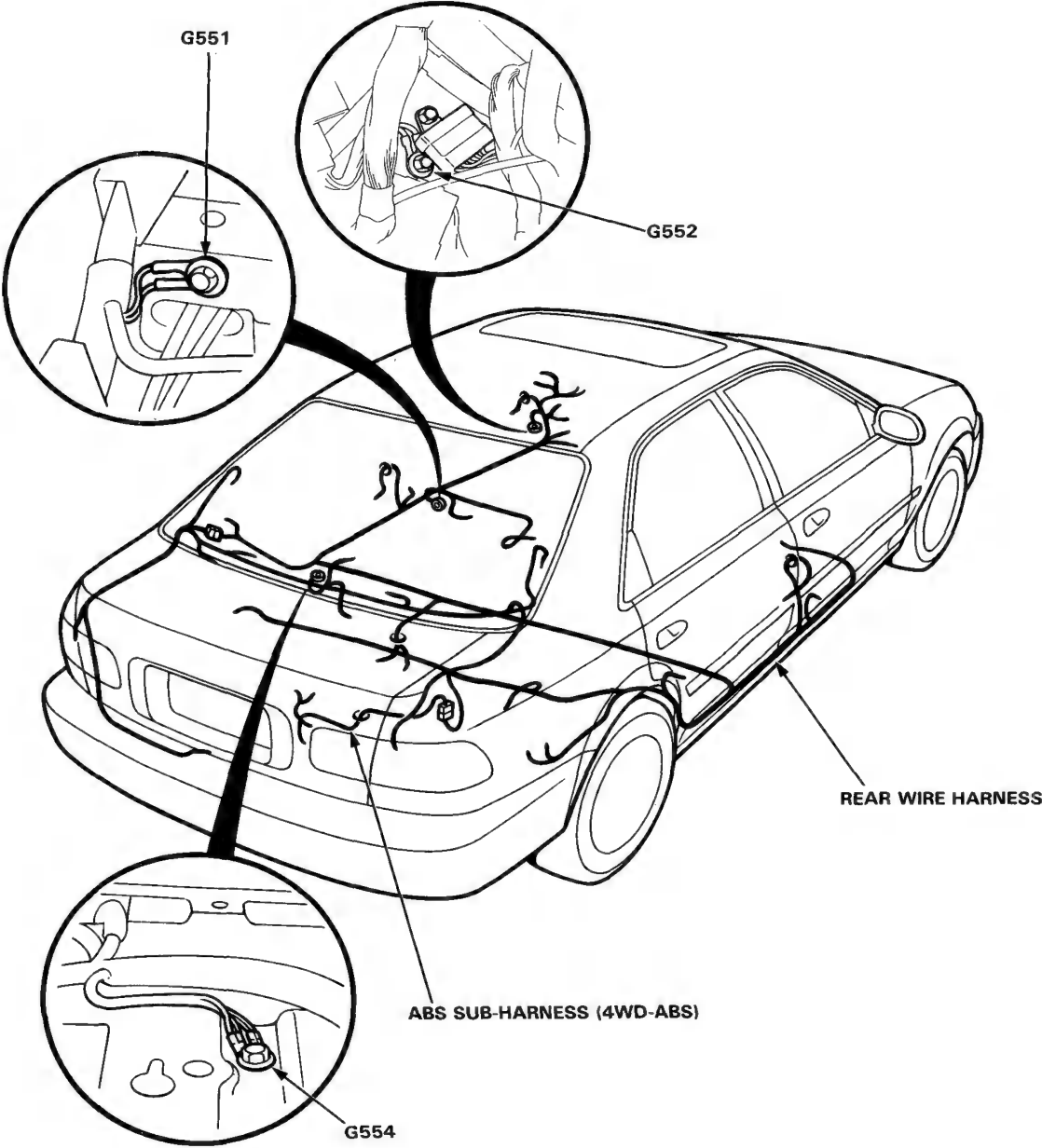




Wire Harness and Ground Locations

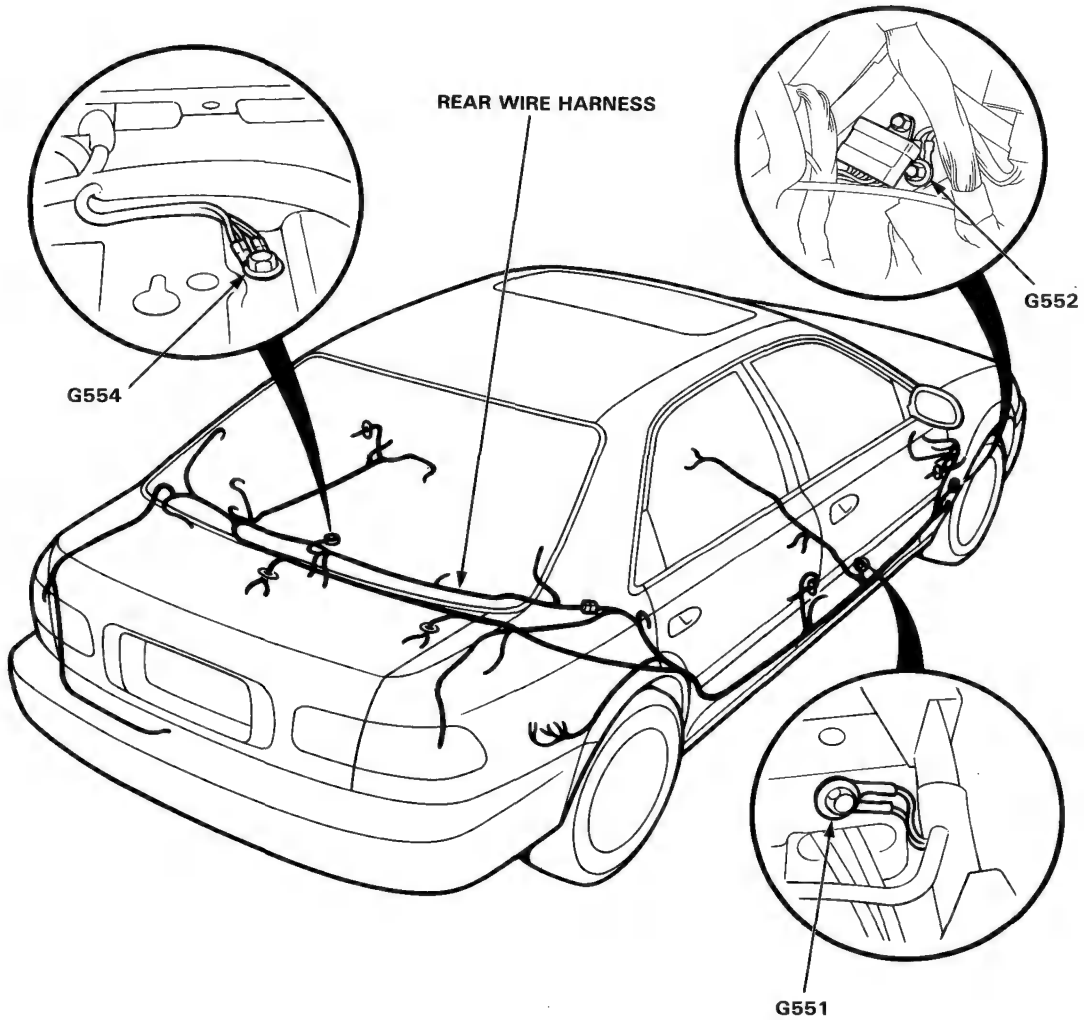
Floor (Sedan)

LHD:



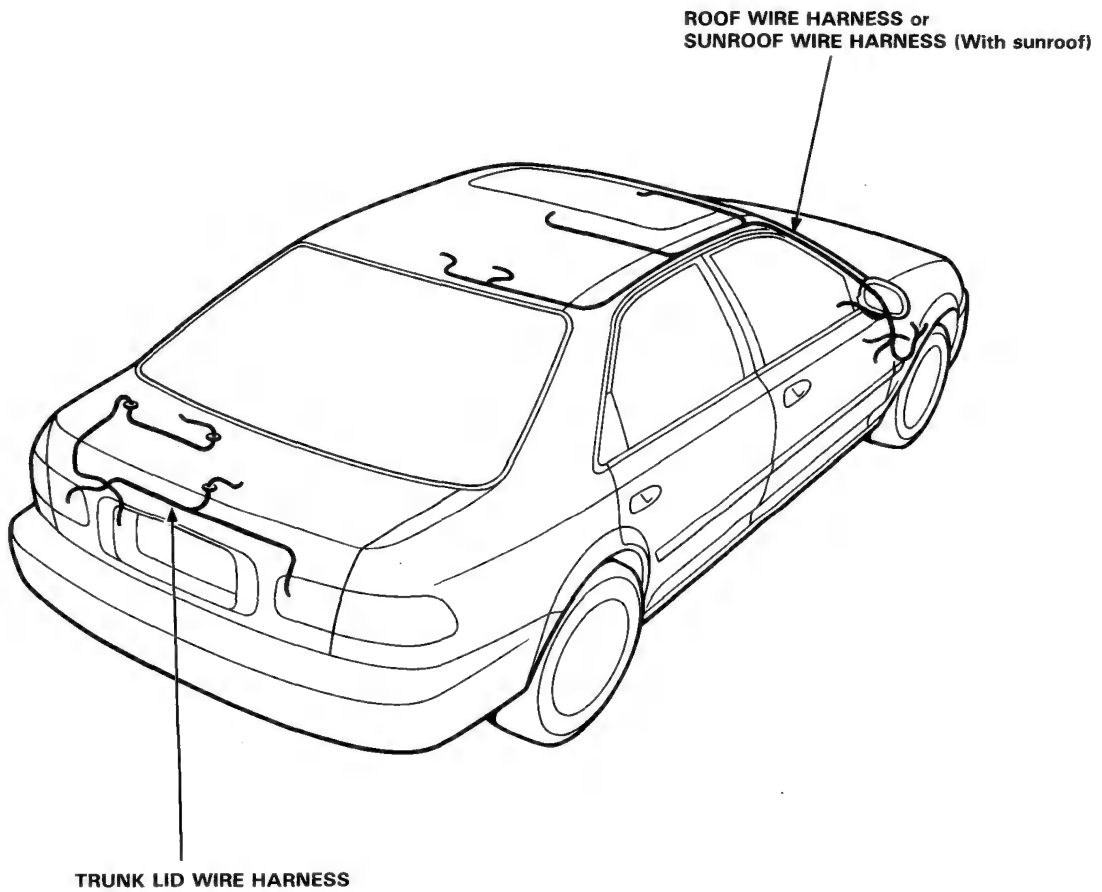


RHD:



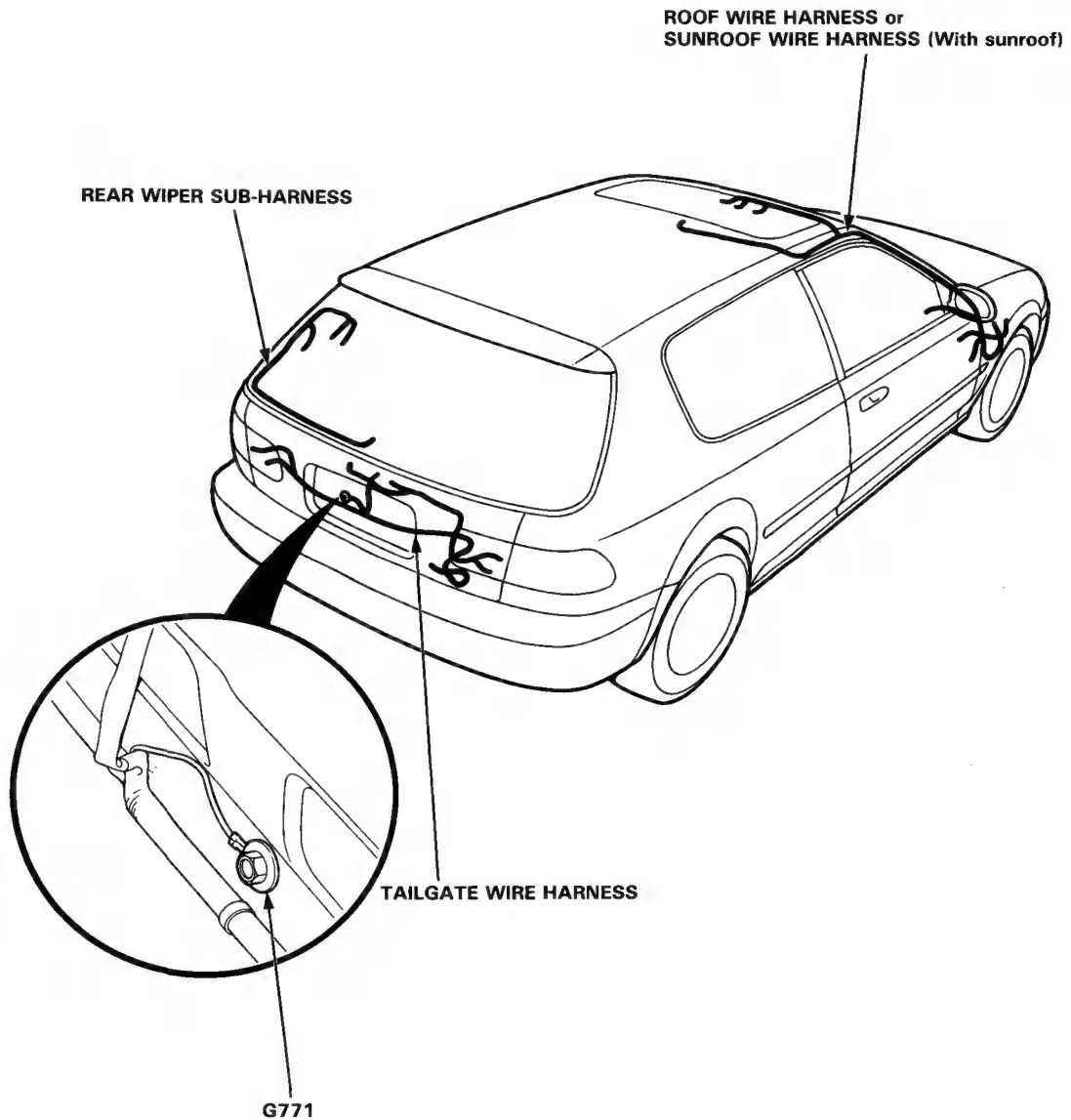
Wire Harness and Ground Locations

Roof and Rear (Sedan)





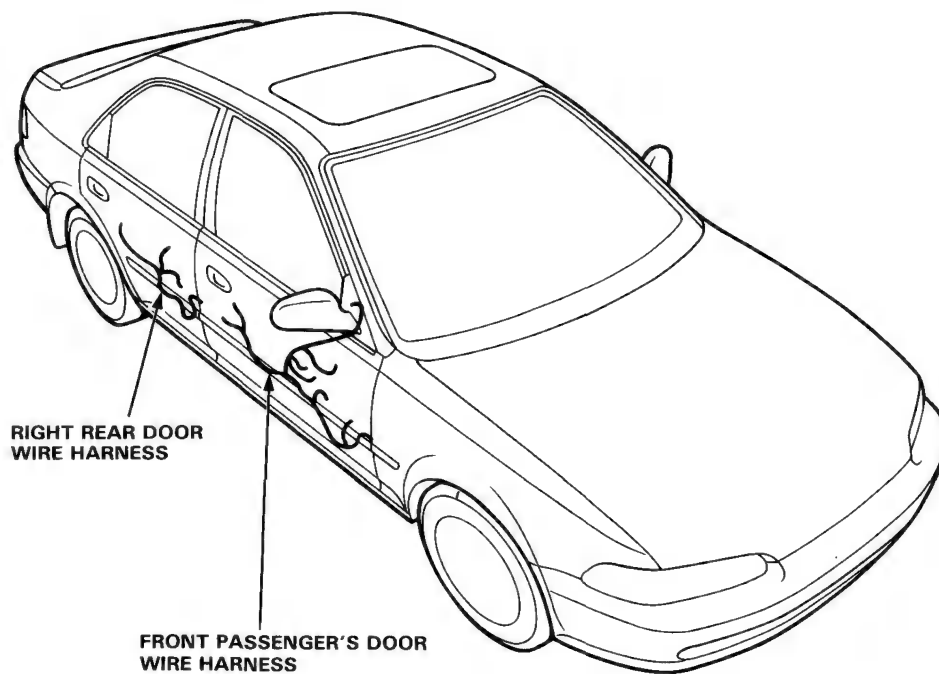
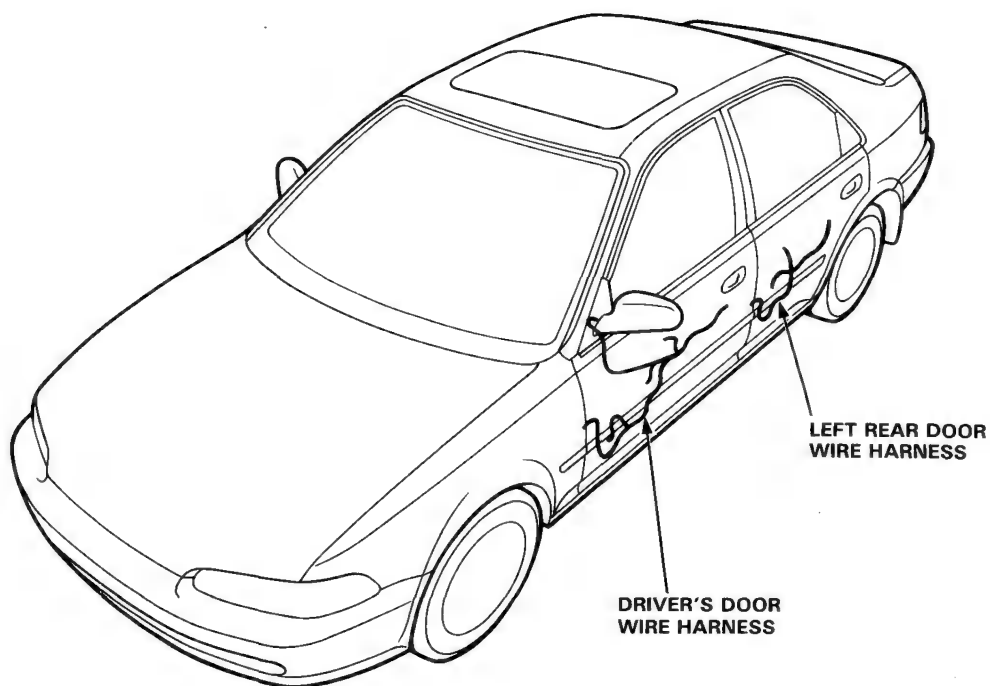
Roof and Rear (Hatchback)



Wire Harness and Ground Locations

Door (Sedan)

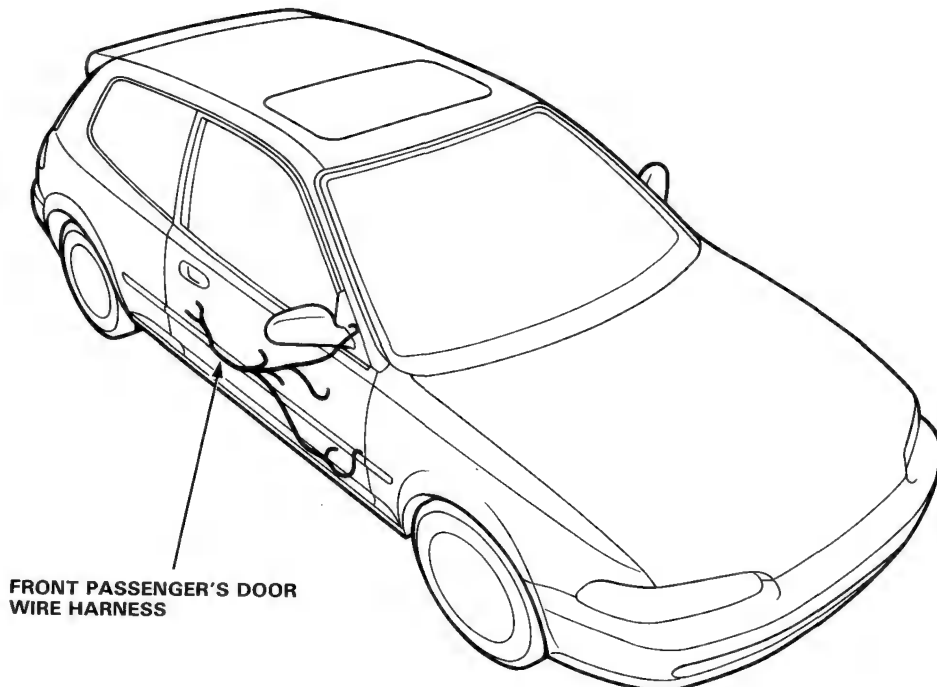
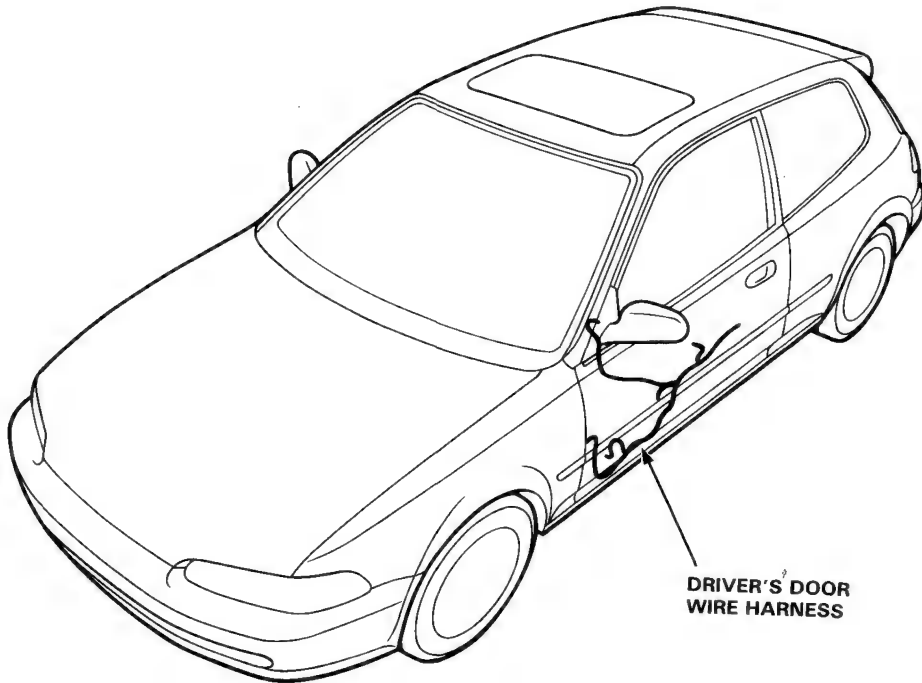
NOTE: LHD type is shown; RHD type is symmetrical.





Door (Hatchback)

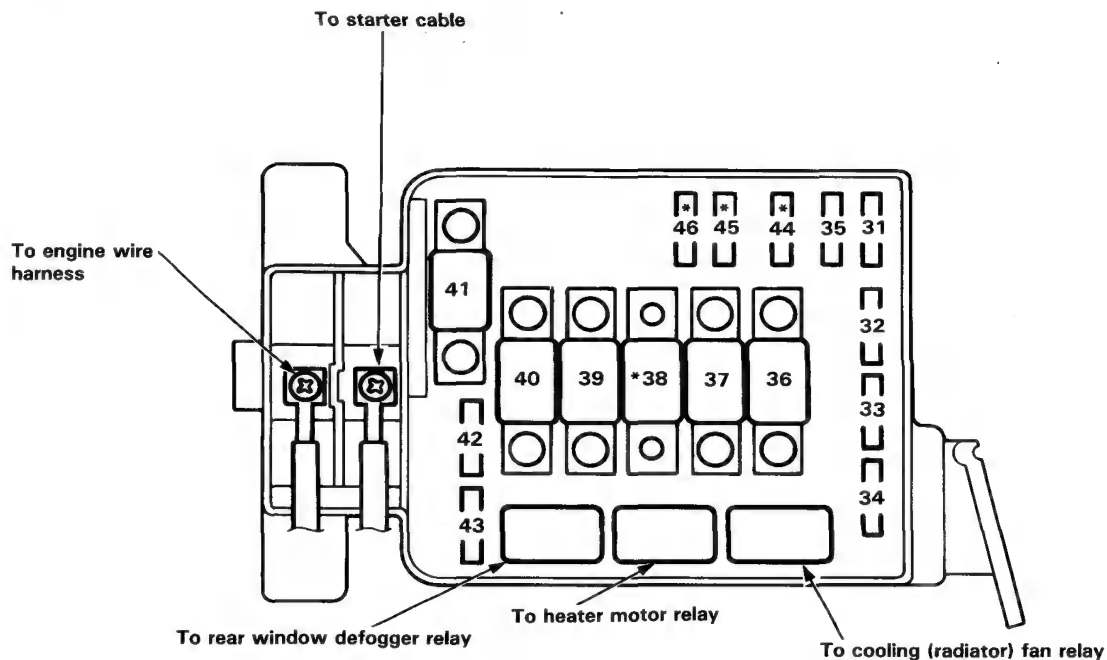
NOTE: LHD type is shown; RHD type is symmetrical.



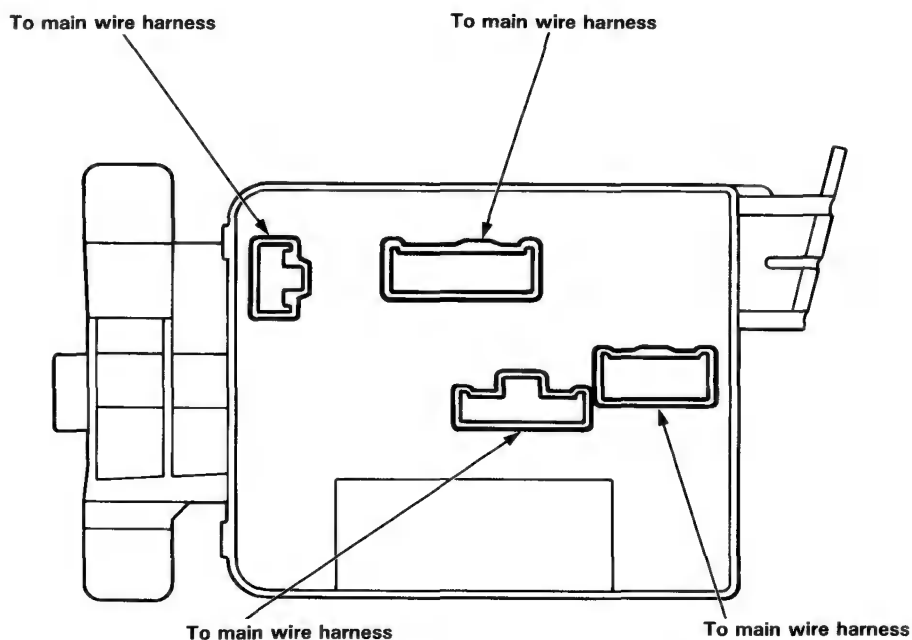
Fuses

Under-Hood Fuse/Relay Box

*: Not used

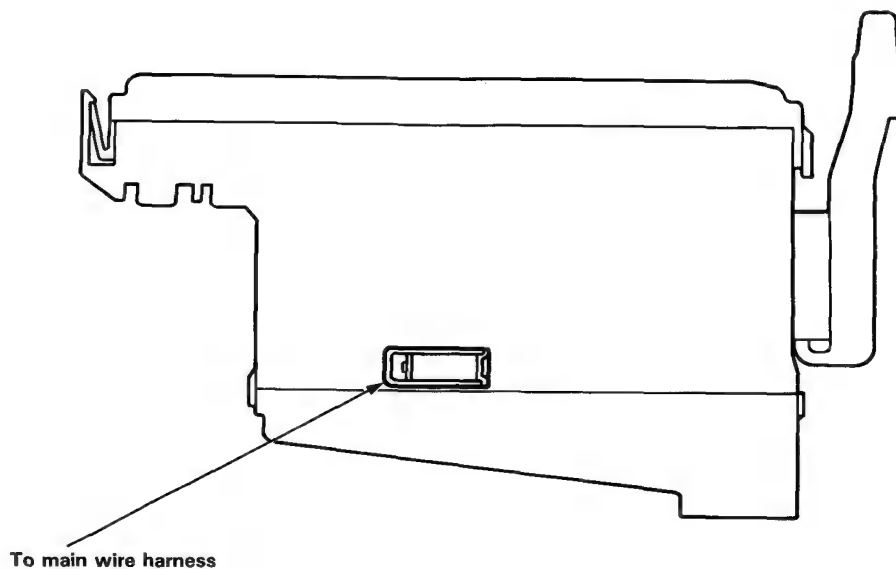


NOTE: View from the back side of the under-hood fuse/relay box.





NOTE: View from the back side of the under-hood fuse/relay box.

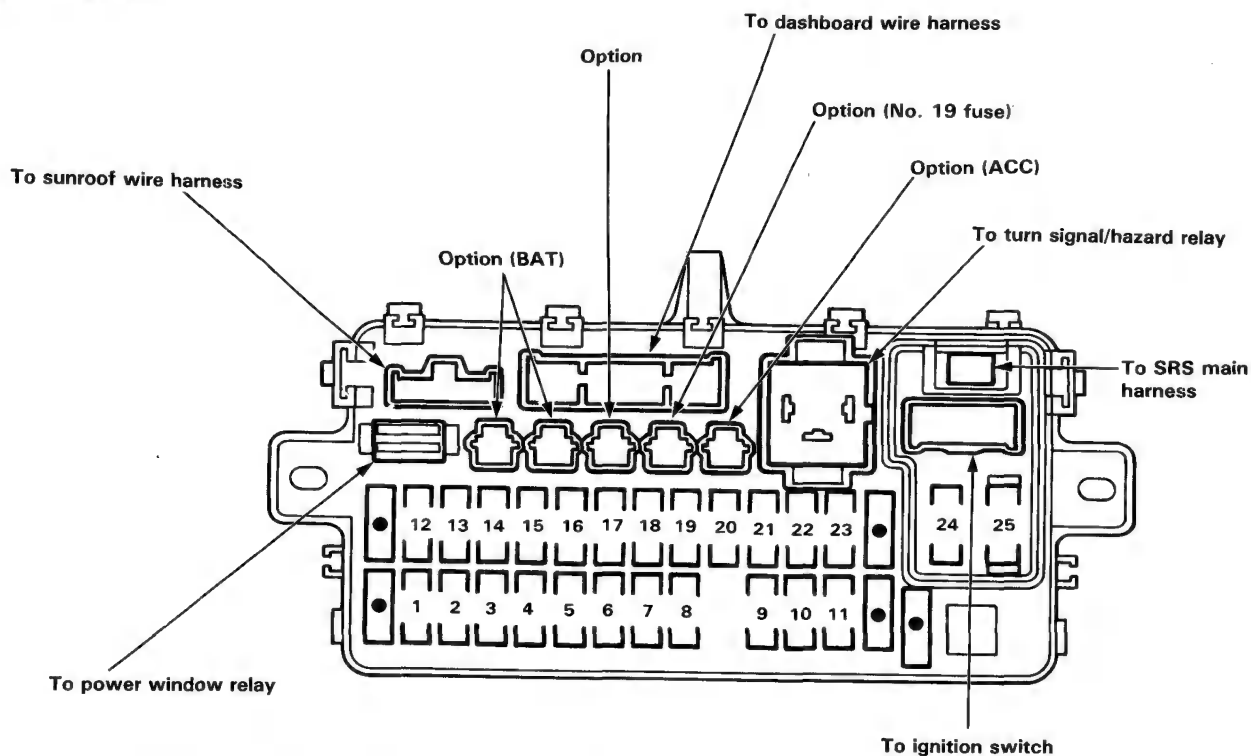


Fuse Number	Amps	Wire Color	Component or Circuit Protected
31	15 A	YEL/WHT	PGM-FI Main relay
32	7.5 A	WHT/BLU	PGM-FI ECU, Clock
33	15 A	BLK/RED	Radiator fan relay (contacts)
34	30 A	BLK/GRN	Rear window defogger relay (contacts)
35	20 A	WHT	Condenser fan motor, A/C clutch relay
36	50 A	WHT/RED	Sunroof, Option
37	30 A	BLU/WHT	Blower relay
38	—	—	Not used
39	50 A	WHT/BLK	Ignition switch (BAT)
40	40 A	WHT	Combination light switch
41	80 A	—	Power distribution
42	20 A	WHT/GRN	Horns, Brake system
43	10 A	WHT/GRN	Hazard light
44	—	—	Not used
45	—	—	Not used
46	—	—	Not used

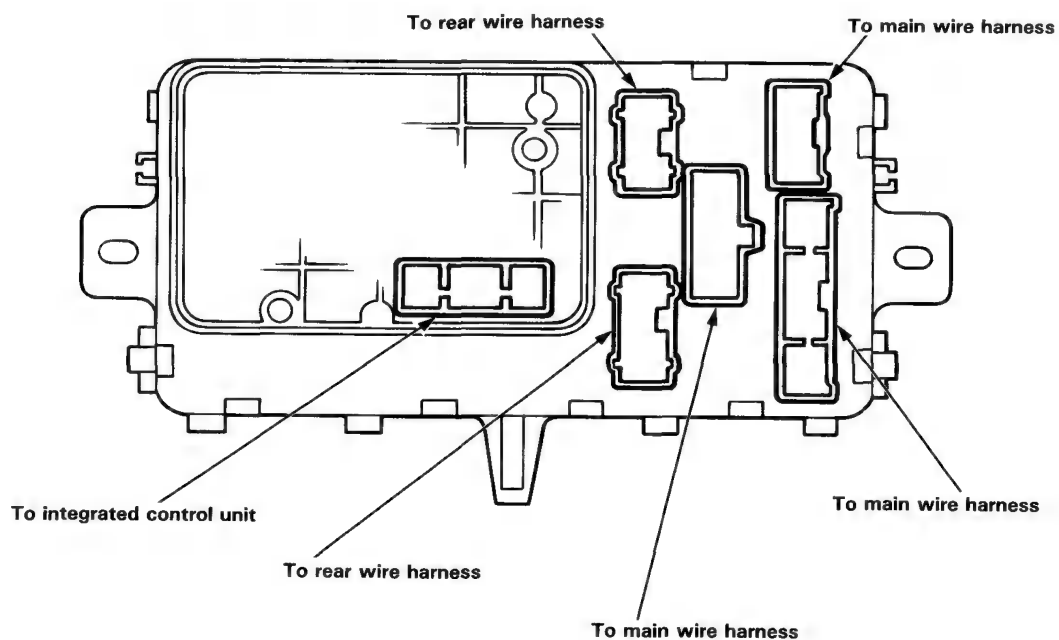
Fuses

Under-Dash Fuse Box

●: Spare fuse



NOTE: View from the backside of the under-dash fuse box.



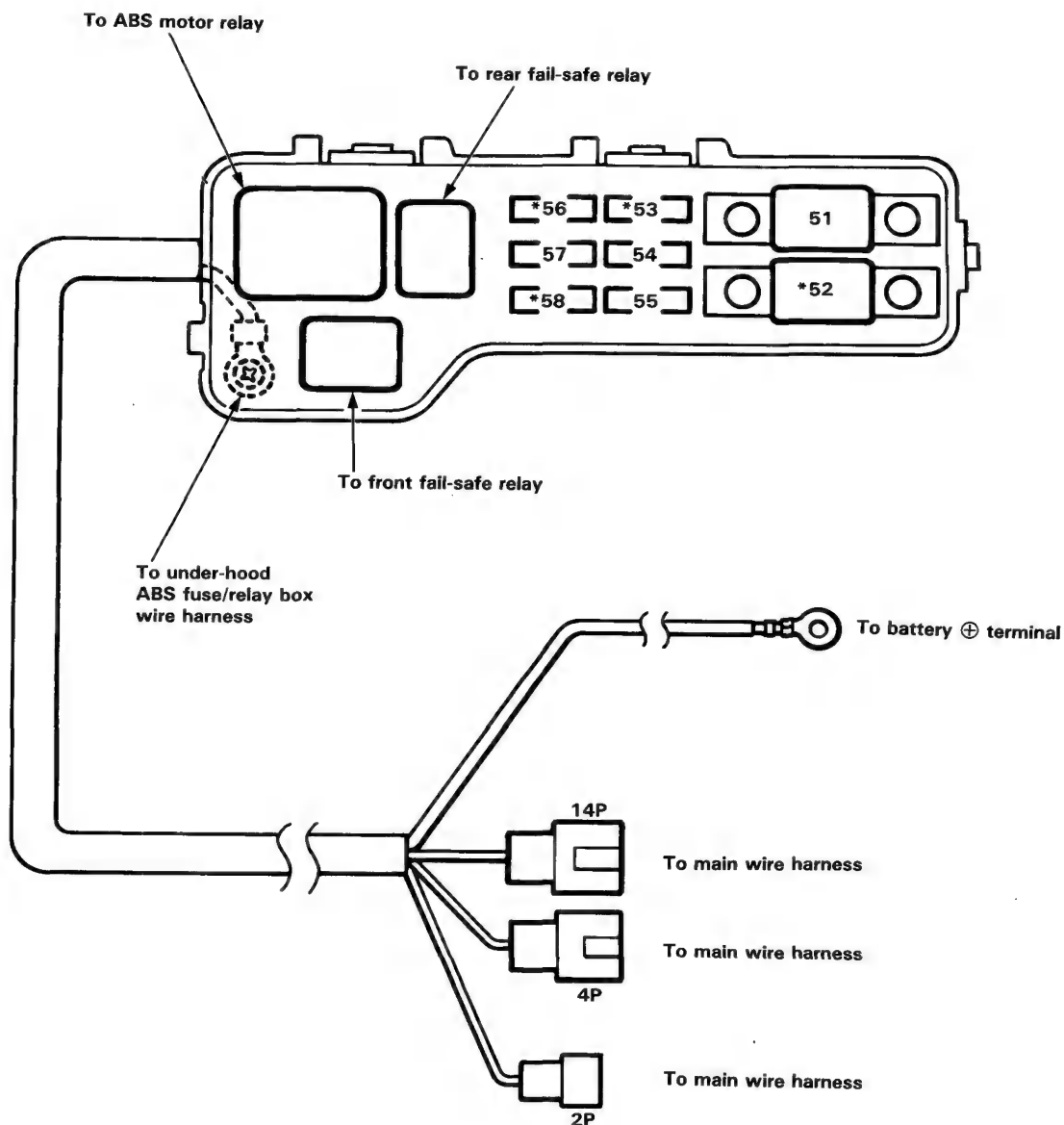


Fuse Number	Amps	Wire Color	Component or Circuit Protected
1	30 A	WHT	Sunroof
2	20 A	WHT/BLK	Seat heater (Some model versions of KG and KS)
3	7.5 A	WHT/BLU	Ceiling light
4	20 A	YEL/BLK	R. rear power window motor
5	20 A	WHT/YEL	Driver's power window motor
6	20 A	WHT/GRN	Power door lock control unit
7	20 A	GRN/BLK	L. rear power window motor
8	20 A	BLU/BLK	Front passenger's power window motor
9	10 A	RED/BLU	R. headlight (HIGH), Integrated control unit (KE, KS)
10	10 A	RED/GRN	L. headlight (HIGH), High beam indicator light
11	20 A	WHT/BLK	Headlight washer control unit (Some model versions of KG and KS)
12	15 A	BLK/YEL	Alternator (No SRS)
13	7.5 A	BLK/YEL	Rear window defogger relay, ABS motor relays
14	20 A	GRN/BLK	Windshield wiper motor, Sunroof relays
15	10 A	YEL	Gauge and warning lights, Clock
16	7.5 A	YEL/BLK	LHD: Integrated control unit (KS) RHD: Option
17	10 A	WHT/YEL	LHD: L. taillights, Option (Europe except KS), Taillights, Front parking lights (KS), Option (Except Europe) RHD: Integrated control unit (KE)
18	7.5 A	BLU/WHT	PGM-FI ECU, PGM-FI ECU Main relay
19	10 A	RED/BLK	Dashlights, Taillights, Front parking lights (Except KS)
20	7.5 A	RED/WHT	Rear fog light
21	10 A	RED/WHT	R. headlight (LOW)
22	10 A	RED/YEL	L. headlight (LOW)
23	15 A	YEL/RED	Stereo radio/cassette player
24	15 A	BLK/YEL	Alternator (With SRS), SRS indicator (With SRS)
25	10 A	RED	SRS unit (With SRS)

Fuses

Under-Hood ABS Fuse/Relay Box

*: 4WD

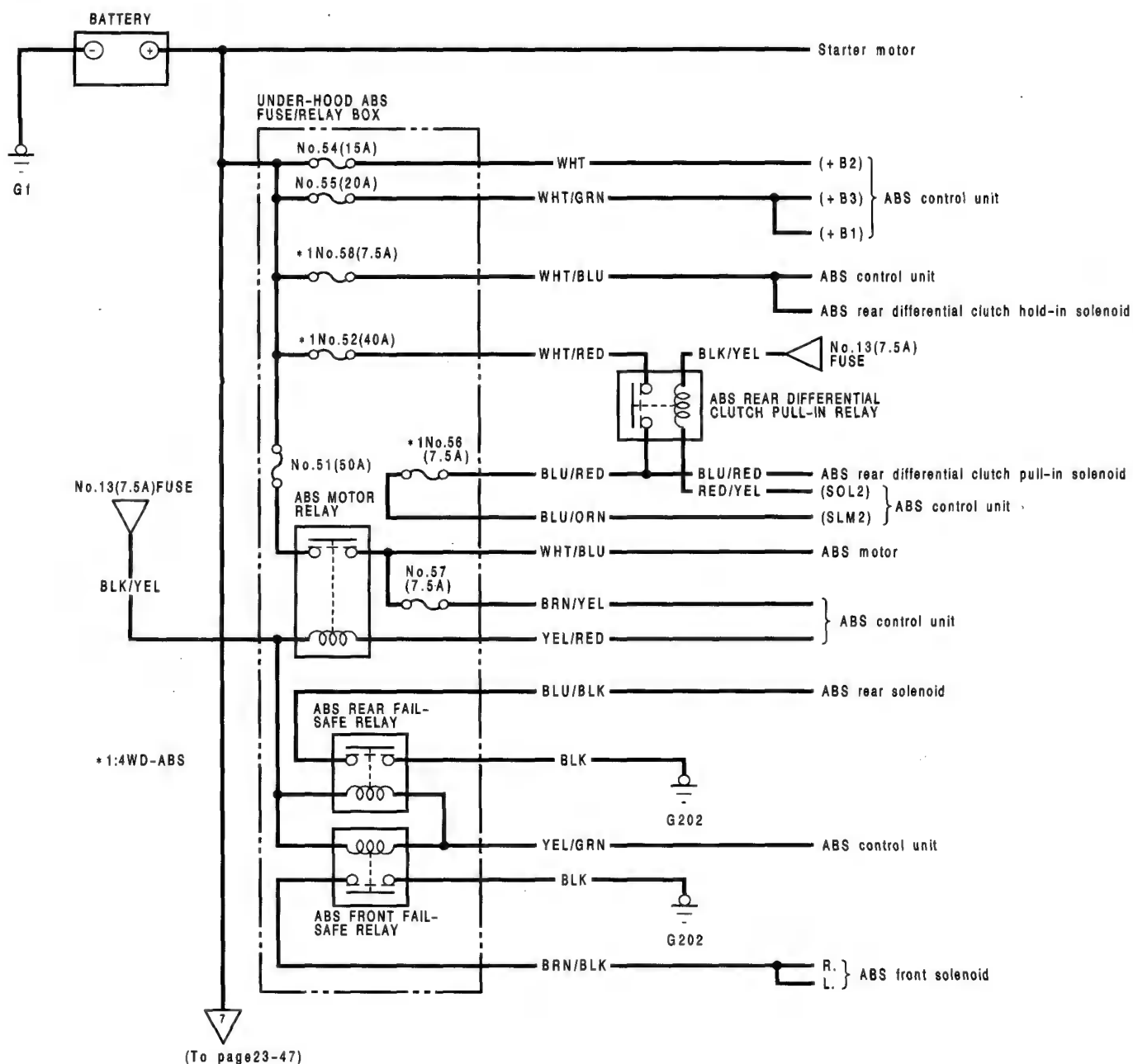


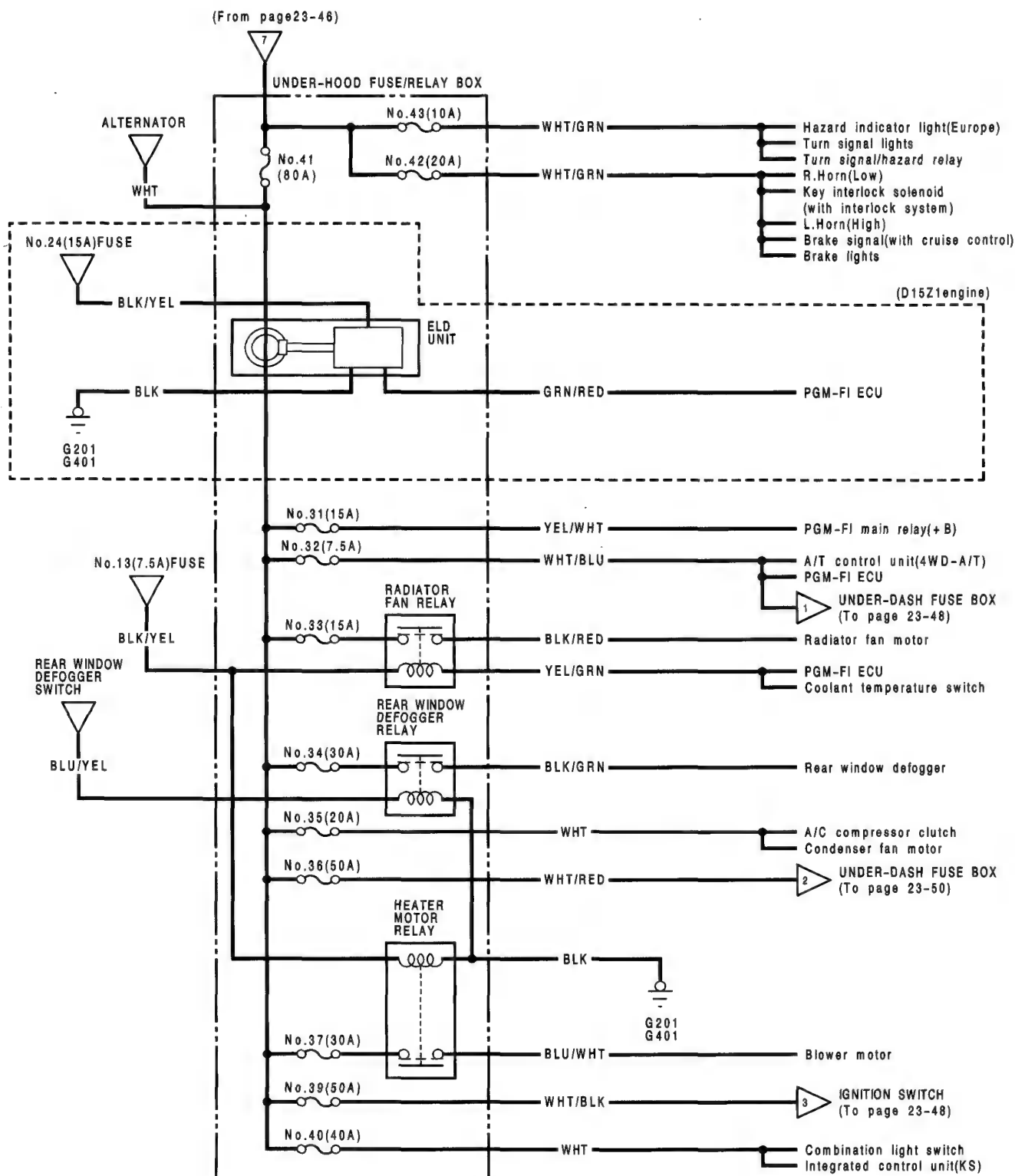


Fuse Number	Amps	Wire Color	Component or Circuit Protected
51	50 A	WHT/BLU	ABS motor relay (contacts)
52	40 A	WHT/RED	Rear differential clutch pull-in relay (4WD)
53	—	—	Not used
54	15 A	WHT	ABS control unit (+B2)
55	20 A	WHT/GRN	ABS control unit (+B1)
56	7.5 A	WHT/BLU	Rear differential clutch hold-in relay (4WD)
57	7.5 A	BRN/YEL	ABS control unit
58	7.5 A	BLU/ORN	ABS control unit (4WD)

Power Distribution (LHD)

Circuit Identification



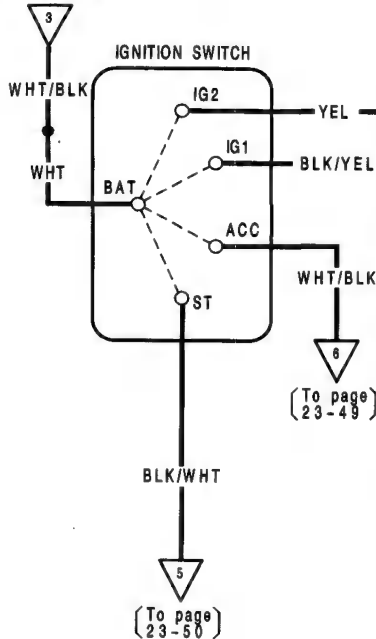


(cont'd)

Power Distribution (LHD)

Circuit Identification (cont'd)

No.39(50A)FUSE
(From page 23-47)



UNDER-DASH FUSE BOX

No.13(7.5A)

No.16(7.5A)

No.14(20A)

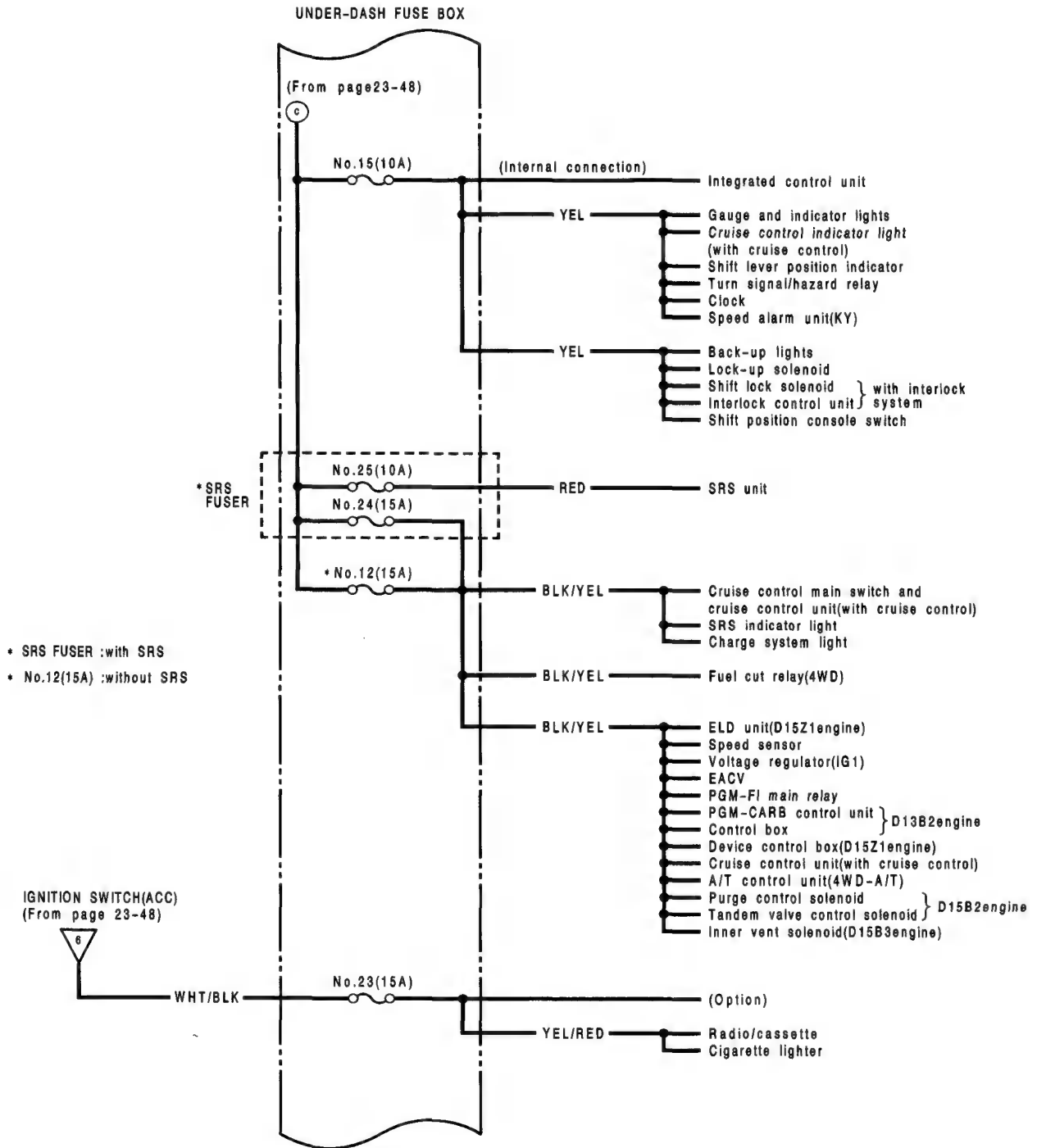
No.32(7.5A)FUSE
(From page 23-47)



WHT/BLU

(To page 23-49)

- BLK/YEL Power door mirror switch
- BLK/YEL Seat heater main relay (some model versions of KG and KS)
- BLK/YEL Front } ABS fail-safe relay
- BLK/YEL Rear } ABS fail-safe relay
- BLK/YEL ABS inspection connector
- BLK/YEL ABS rear differential inspection connector(4WD-ABS)
- BLK/YEL ABS motor relay } 2WD
- BLK/YEL ABS control unit } 2WD
- BLK/YEL } ABS control unit(4WD)
- BLK/YEL ABS rear differential clutch pull-in relay } 4WD-ABS
- BLK/YEL ABS rear differential clutch hold-in relay } 4WD-ABS
- BLK/YEL Rear window defogger relay
- BLK/YEL Radiator fan relay
- BLK/YEL Heater motor relay
- BLK/YEL Recirculation control motor
- BLK/YEL Mode control motor
- BLK/YEL Heater control panel
- BLK/YEL Condenser fan relay
- BLK/YEL A/C compressor clutch relay
- BLK/YEL A/C delay control unit(CARB:KY,KP) (Option)
- YEL/BLK Integrated control unit(KS)
- BLK/YEL Ignition coil
- GRN/BLK Open } sunroof relay
- GRN/BLK Close } sunroof relay
- GRN/BLK Windshield washer motor
- GRN/BLK Rear window washer motor(Hatchback)
- GRN/BLK Integrated control unit
- GRN/BLK Windshield wiper motor
- GRN/BLK Headlight washer control unit (some model versions of KG and KS)
- GRN/BLK L. } headlight adjuster(KG)
- GRN/BLK R. } headlight adjuster(KG)
- GRN/BLK Headlight washer control unit (some model versions of KG and KS)
- GRN/BLK Rear window wiper motor(Hatchback)
- (Internal connection) Integrated control unit(Except KS)
- (Internal connection) Power window relay
- WHT/BLU Radio/cassette
- WHT/BLU Clock

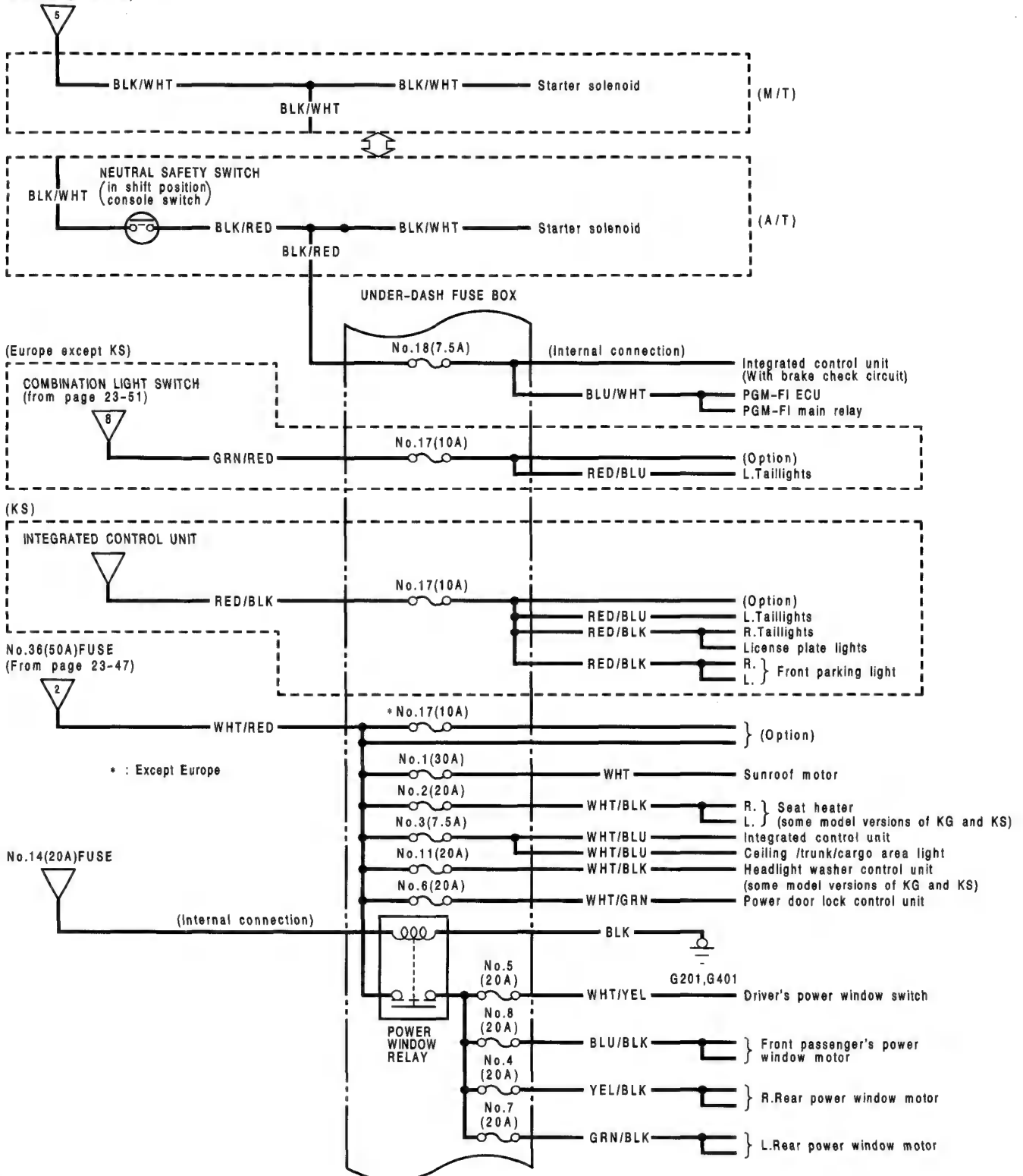


(cont'd)

Power Distribution (LHD)

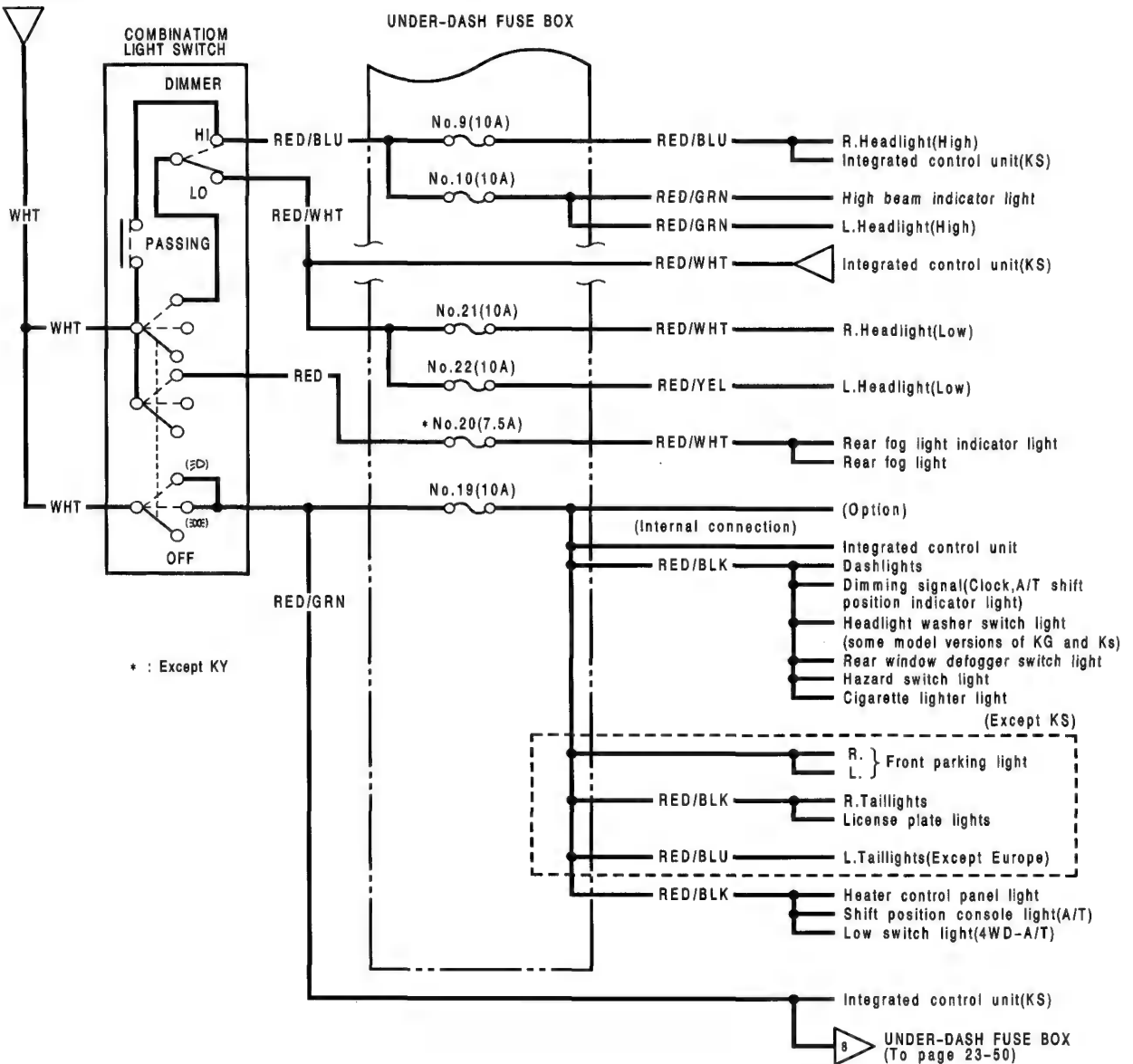
Circuit Identification (cont'd)

IGNITION SWITCH(ST)
(From page 23-48)





No.40(40A)FUSE

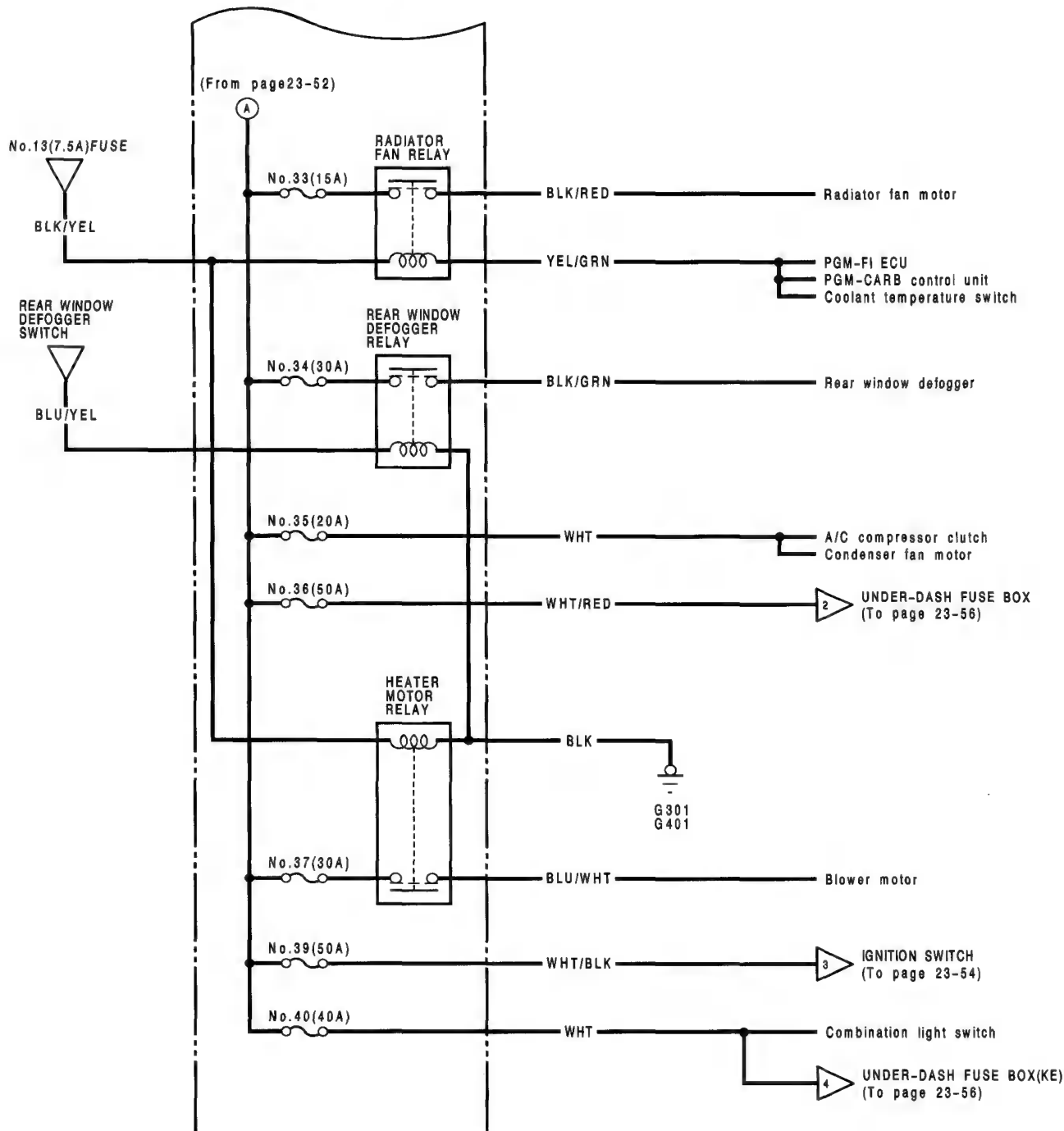


Circuit Identification





UNDER-HOOD FUSE/RELAY BOX

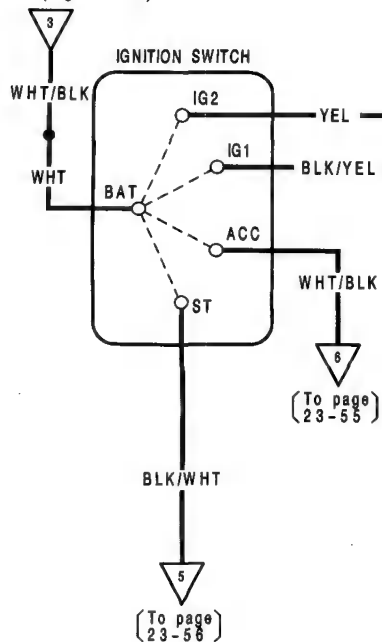


(cont'd)

Power Distribution (RHD)

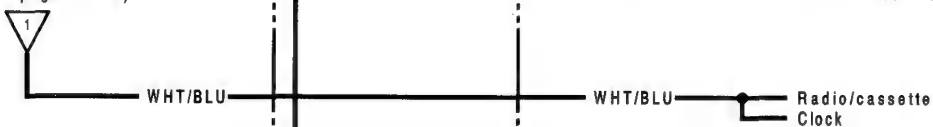
Circuit Identification (cont'd)

No.39(50A)FUSE
(From page 23-53)

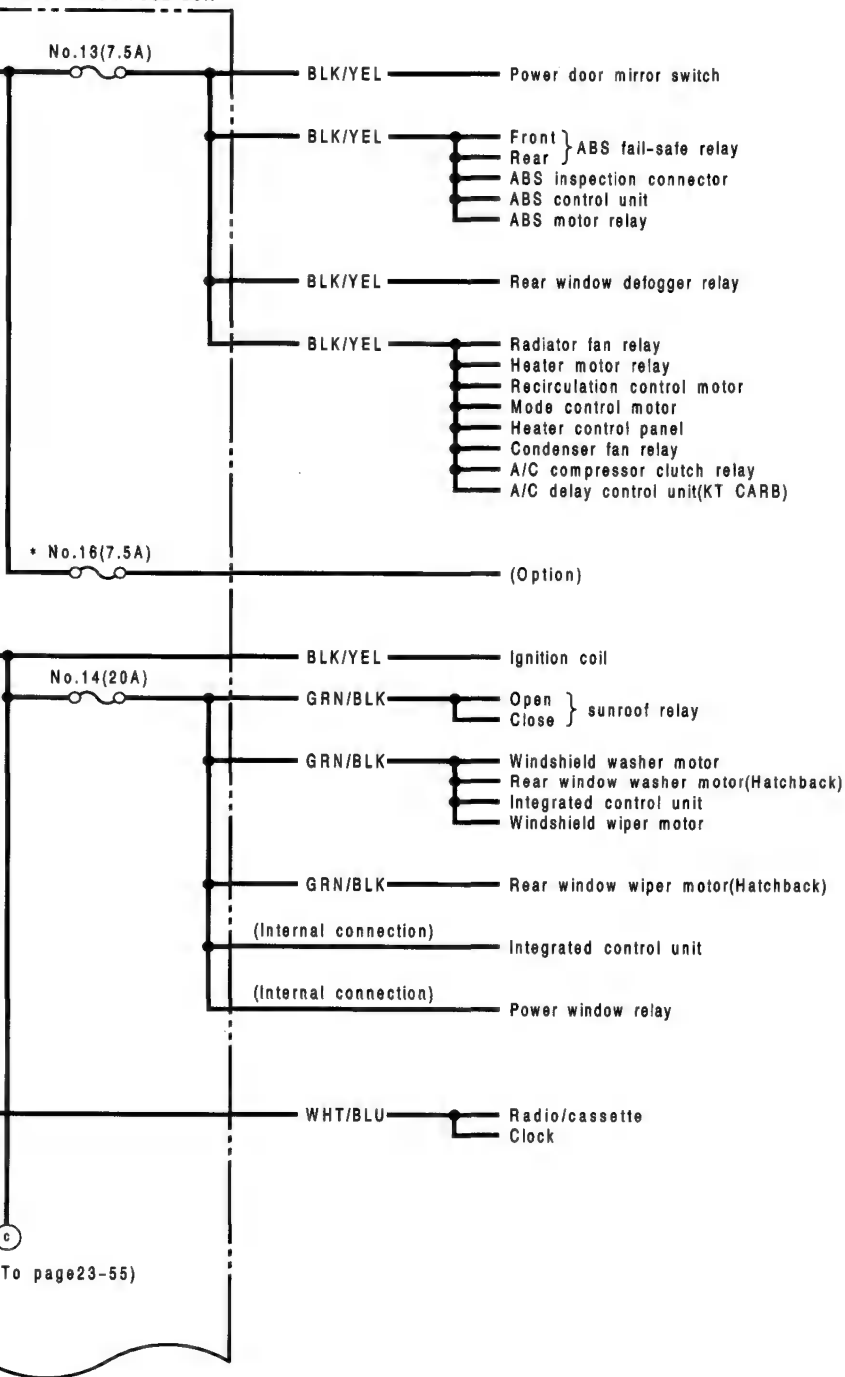


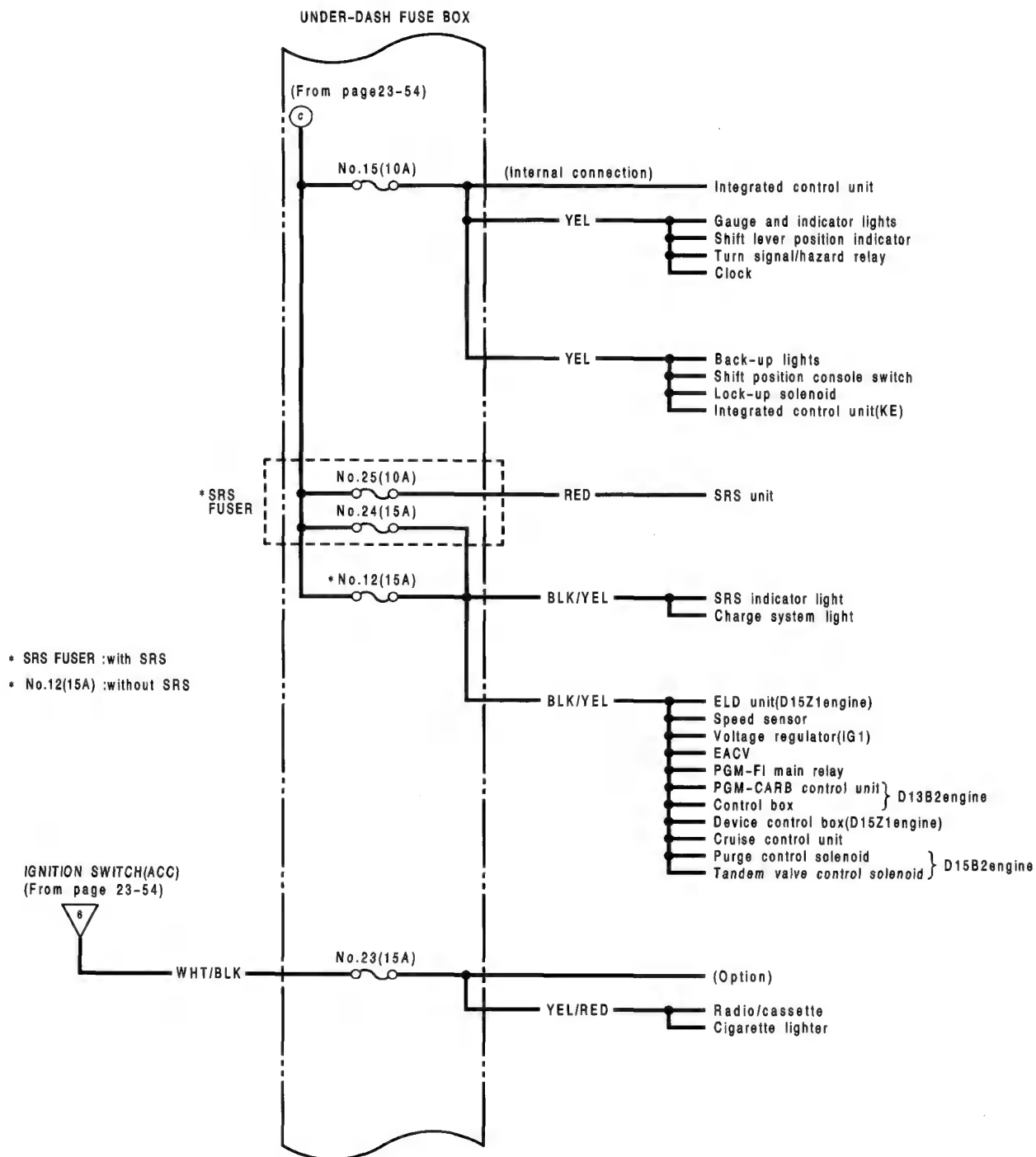
* : KE

No.32(7.5A)FUSE
(From page 23-52)



UNDER-DASH FUSE BOX

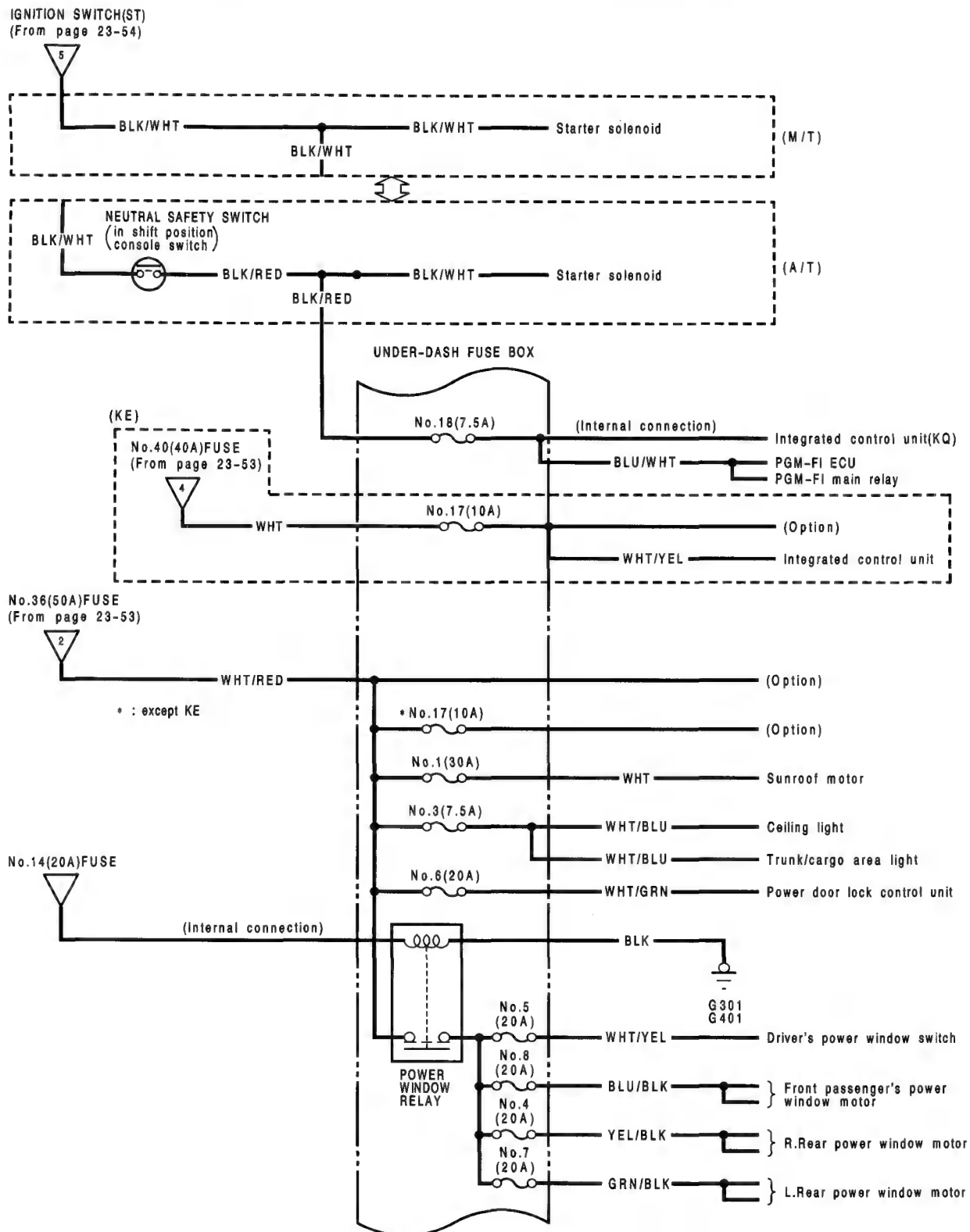




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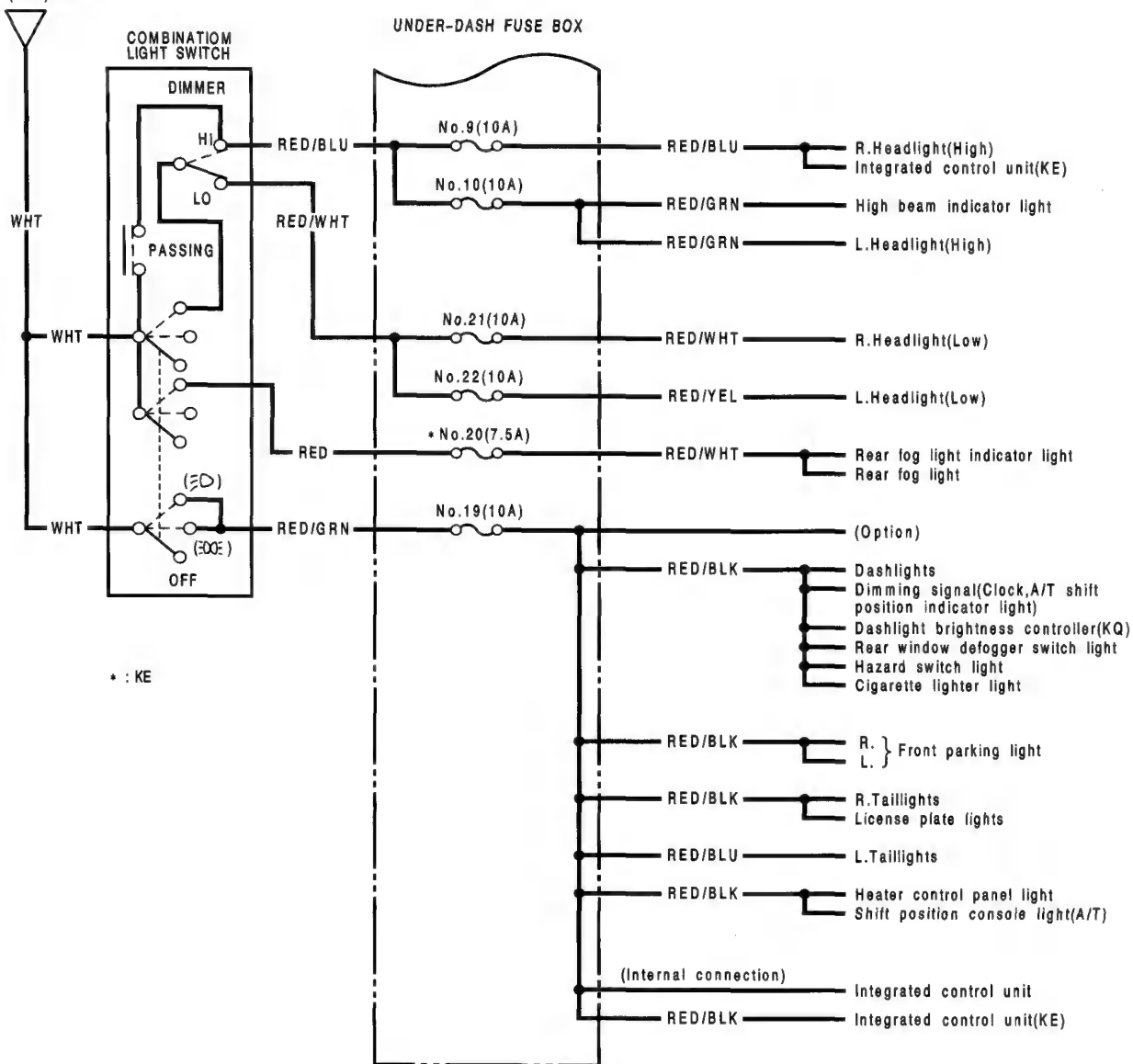
Power Distribution (RHD)

Circuit Identification (cont'd)



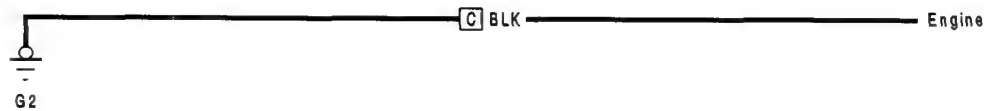
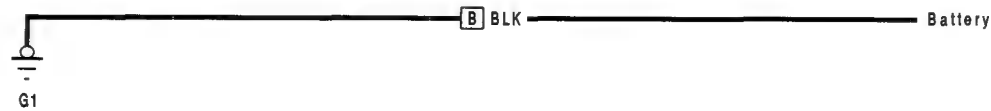


No.40(40A)FUSE

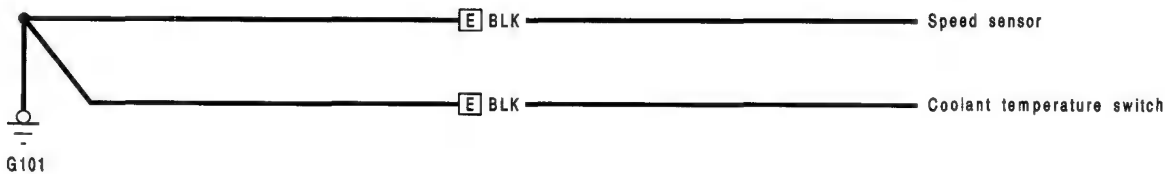


Ground Distribution

Circuit Identification



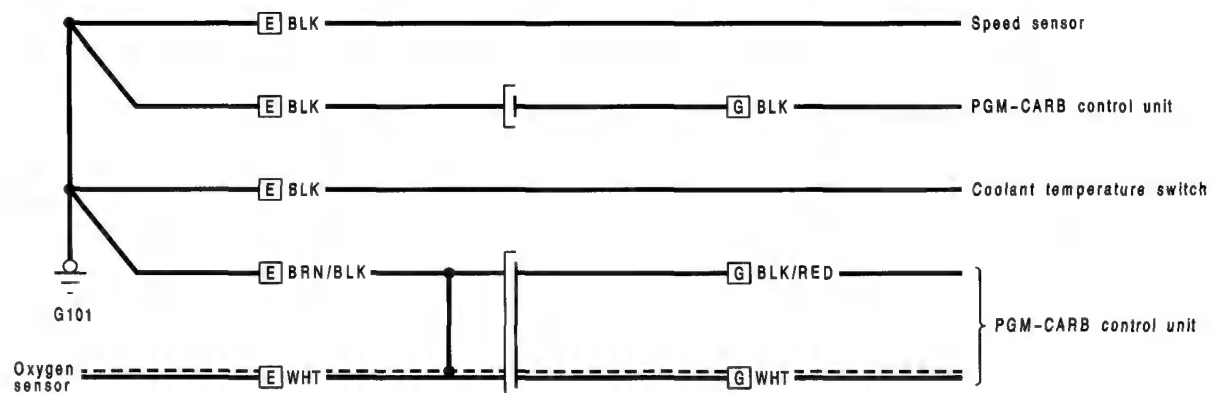
CARB(except PGM-CARB) :



- [B] : Battery ground wire
- [C] : Engine ground wire A
- [D] : Engine ground wire B
- [E] : Engine wire harness



PGM-CARB:



[E] : Engine wire harness
[G] : Main wire harness

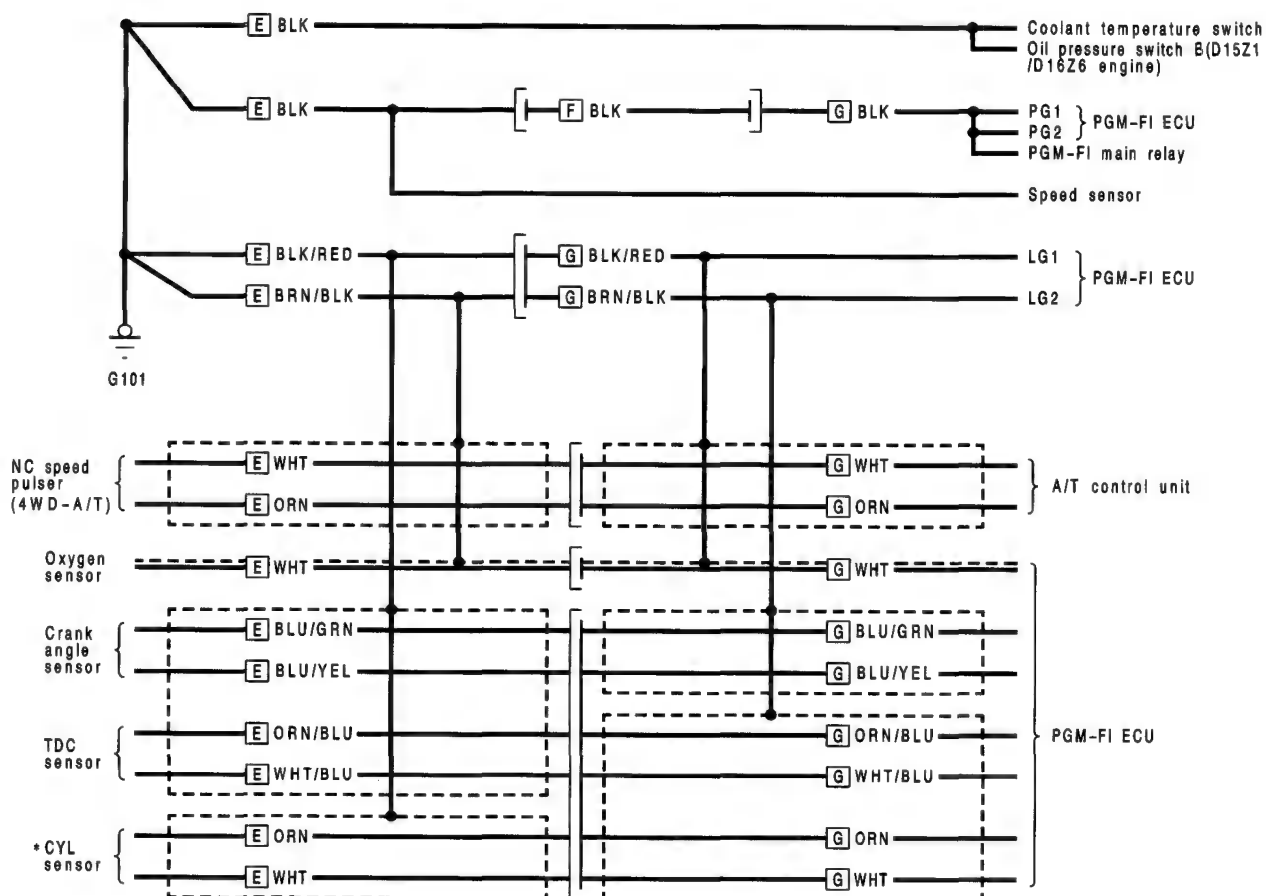
----- : Shielded wire

(cont'd)

Ground Distribution

Circuit Identification (cont'd)

PGM-FI (except D15Z1):



E : Engine wire harness

F : Engine compartment wire harness

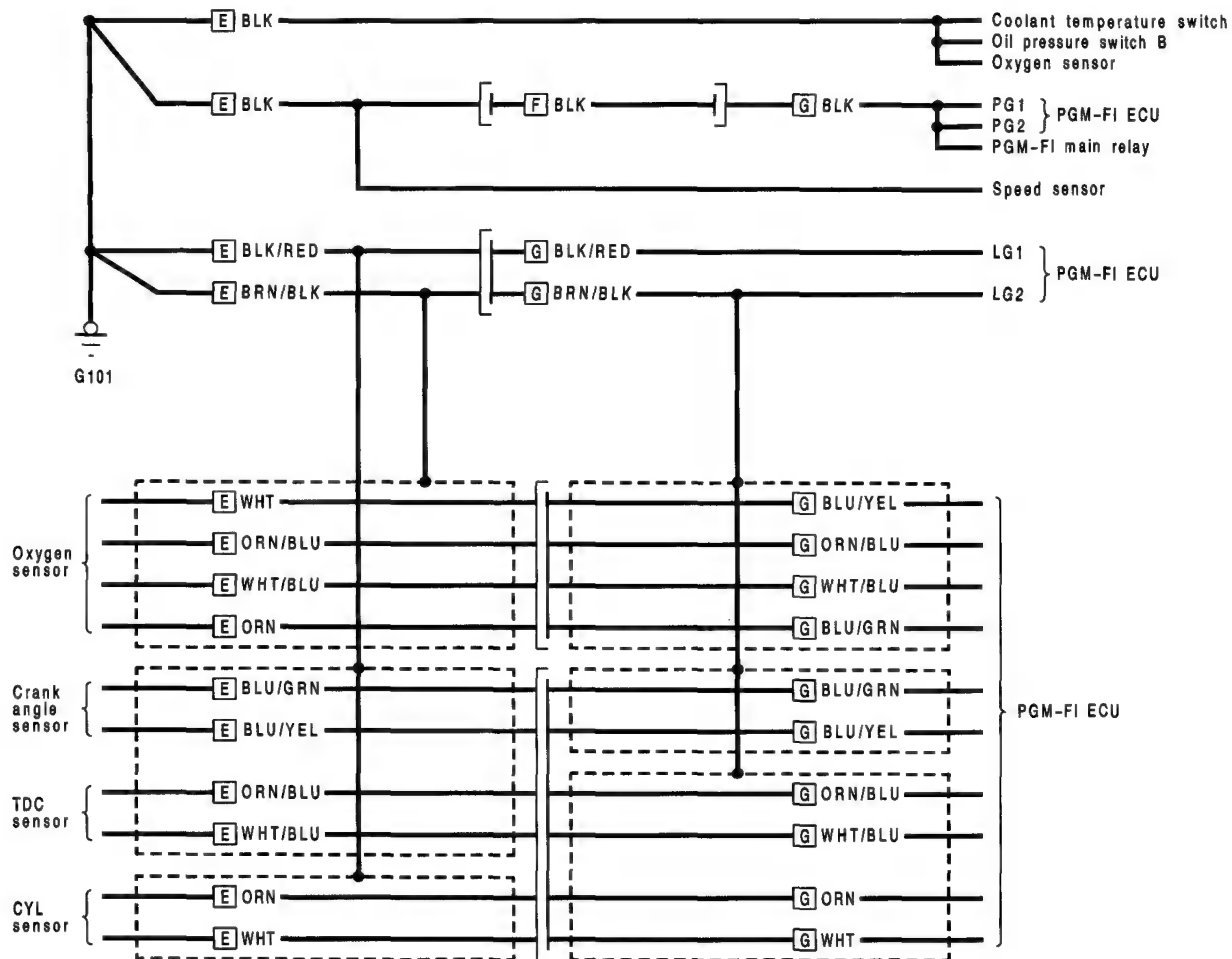
G : Main wire harness

----- : Shielded wire

* : Except D15B2engine

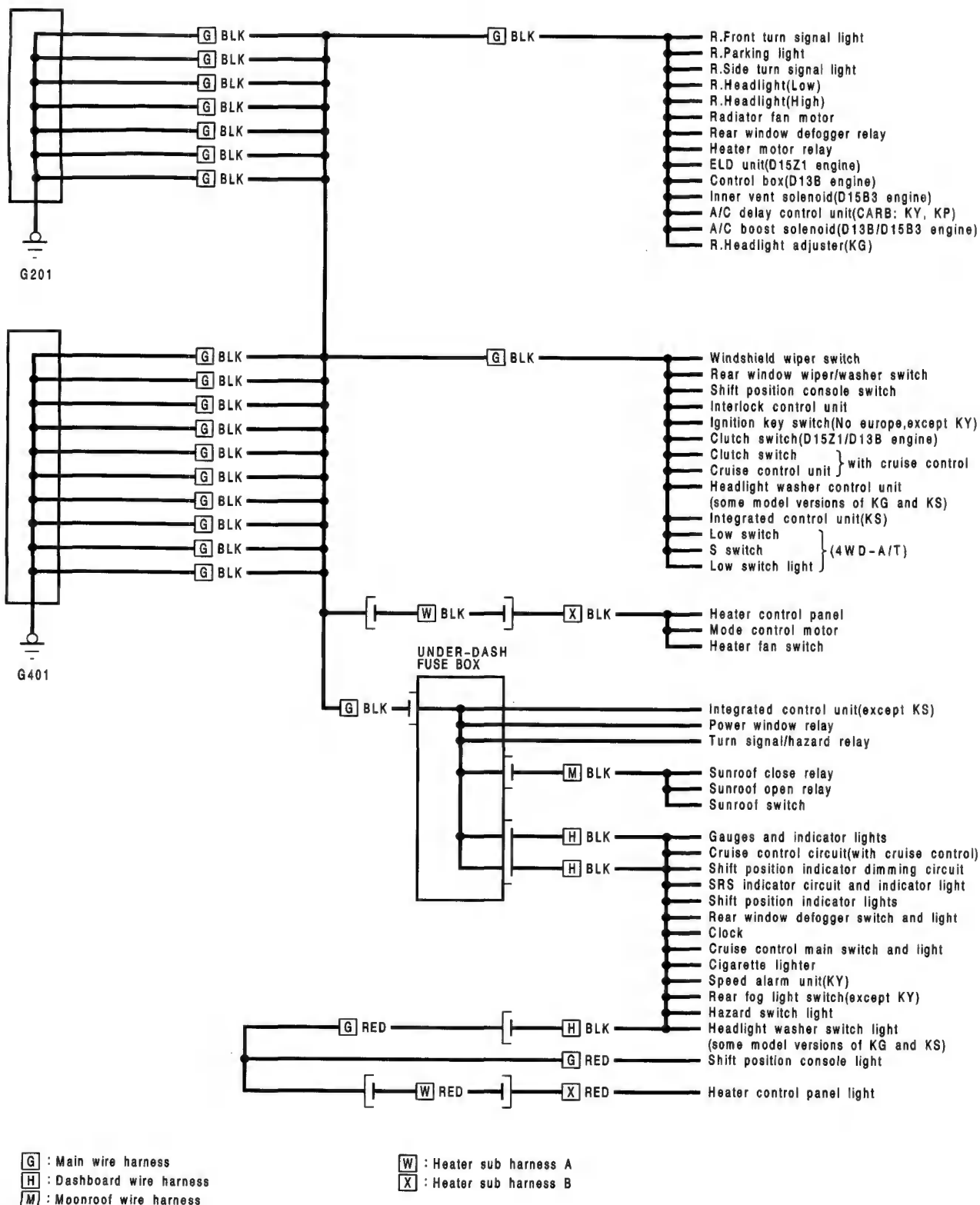


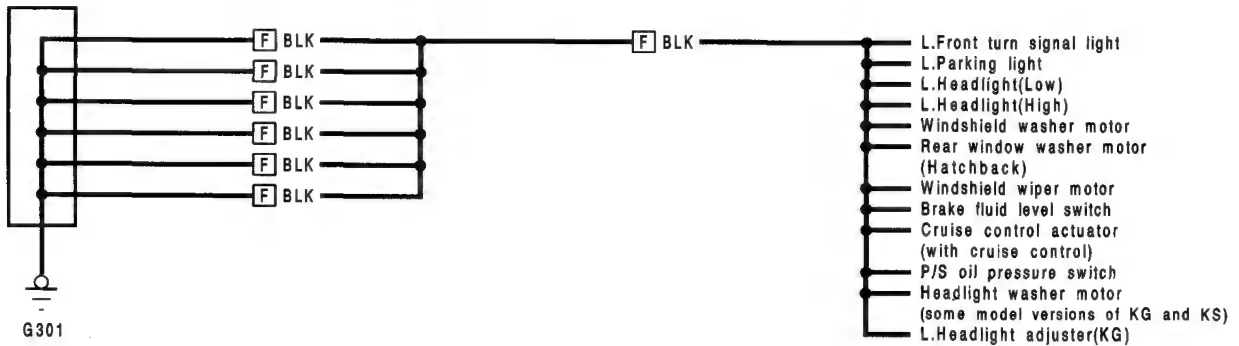
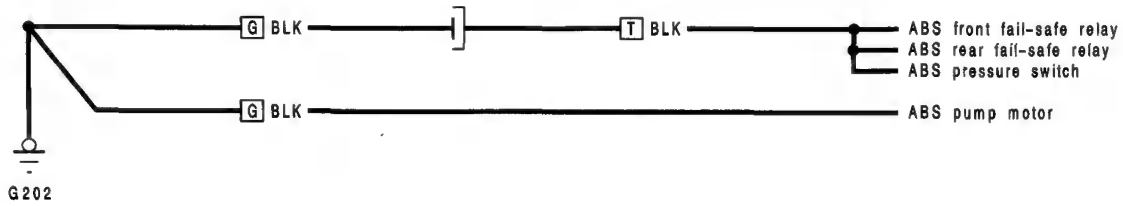
D15Z1 engine:



Ground Distribution

Circuit Identification (LHD)

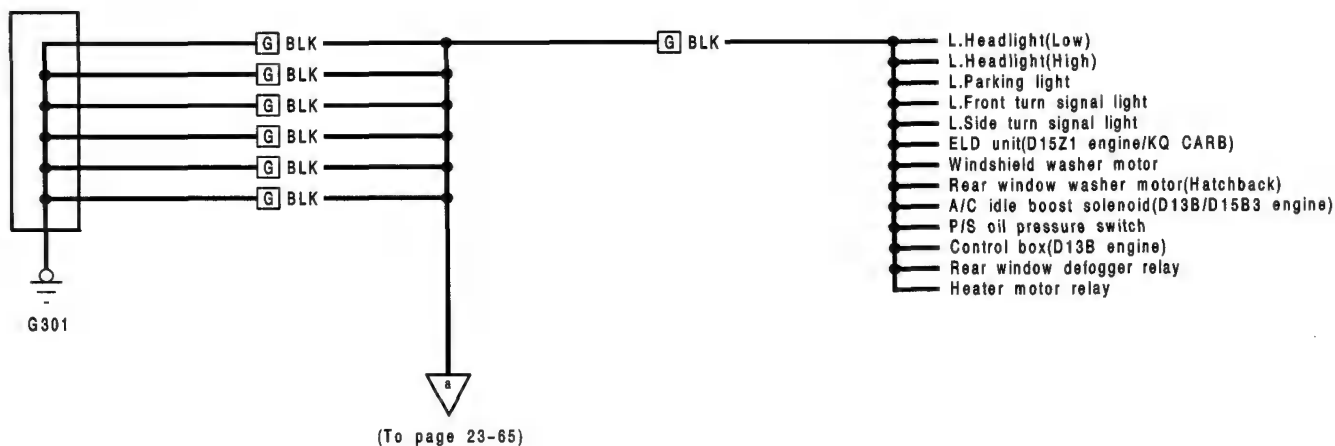
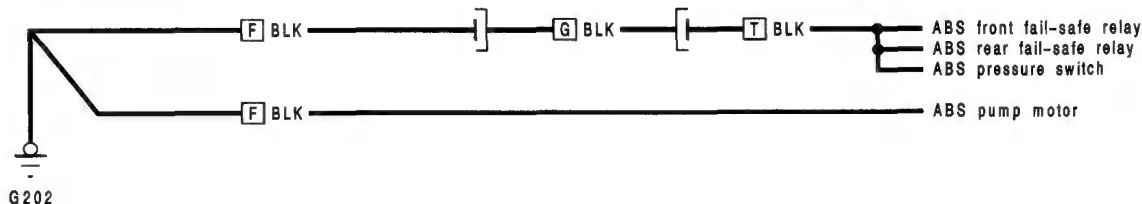
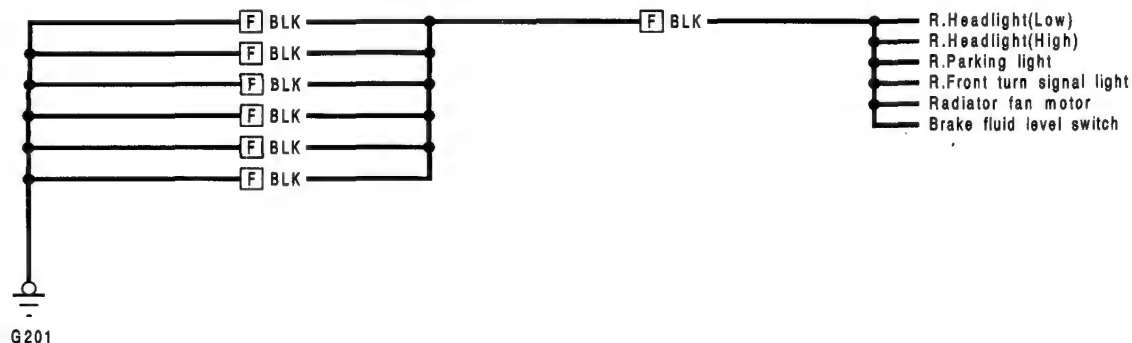




F : Engine compartment wire harness
G : Main wire harness
T : Under-hood ABS fuse/relay box wire harness

Ground Distribution

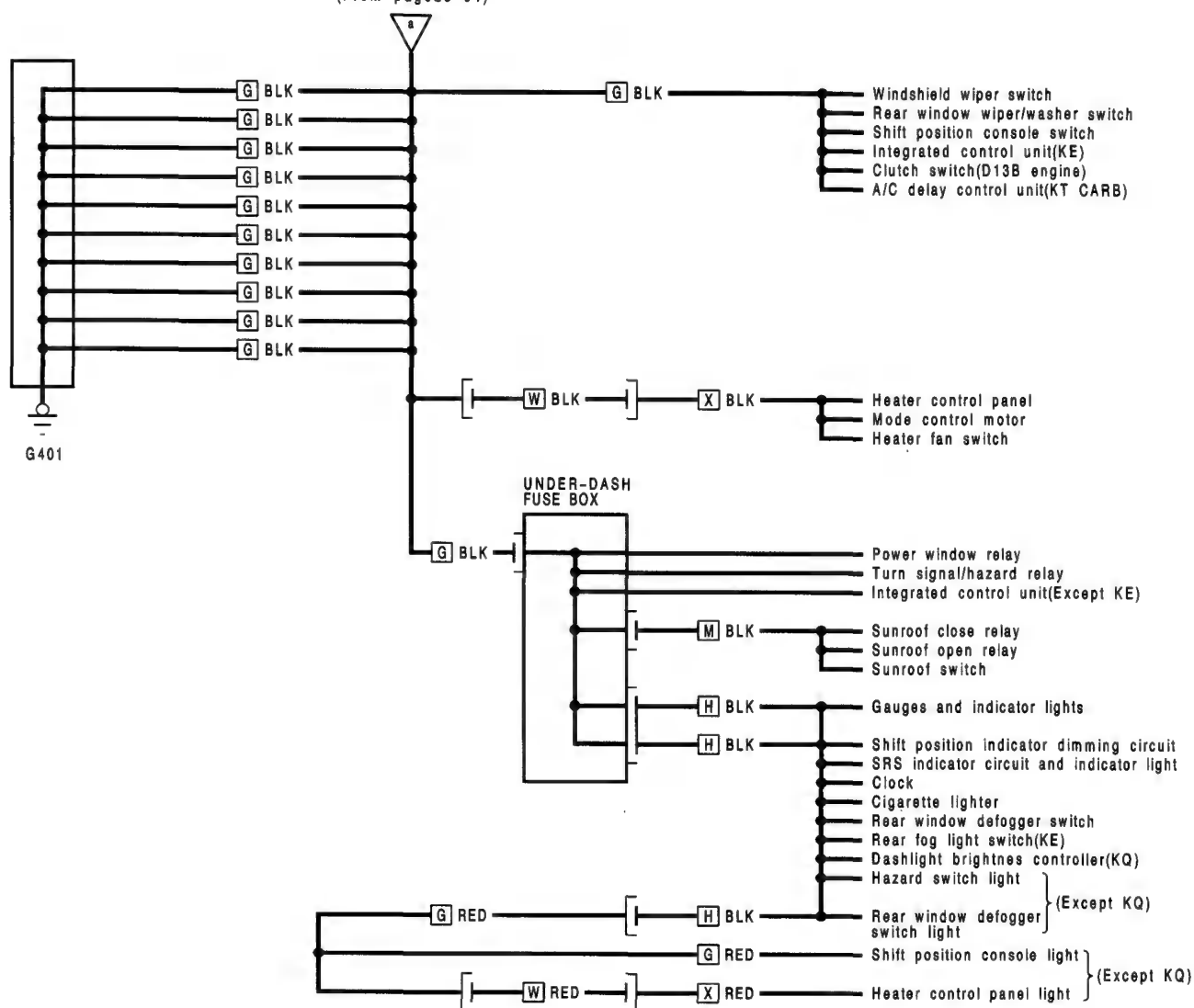
Circuit Identification (RHD)



F : Engine compartment wire harness
 G : Main wire harness
 T : Under-hood ABS fuse/relay box wire harness

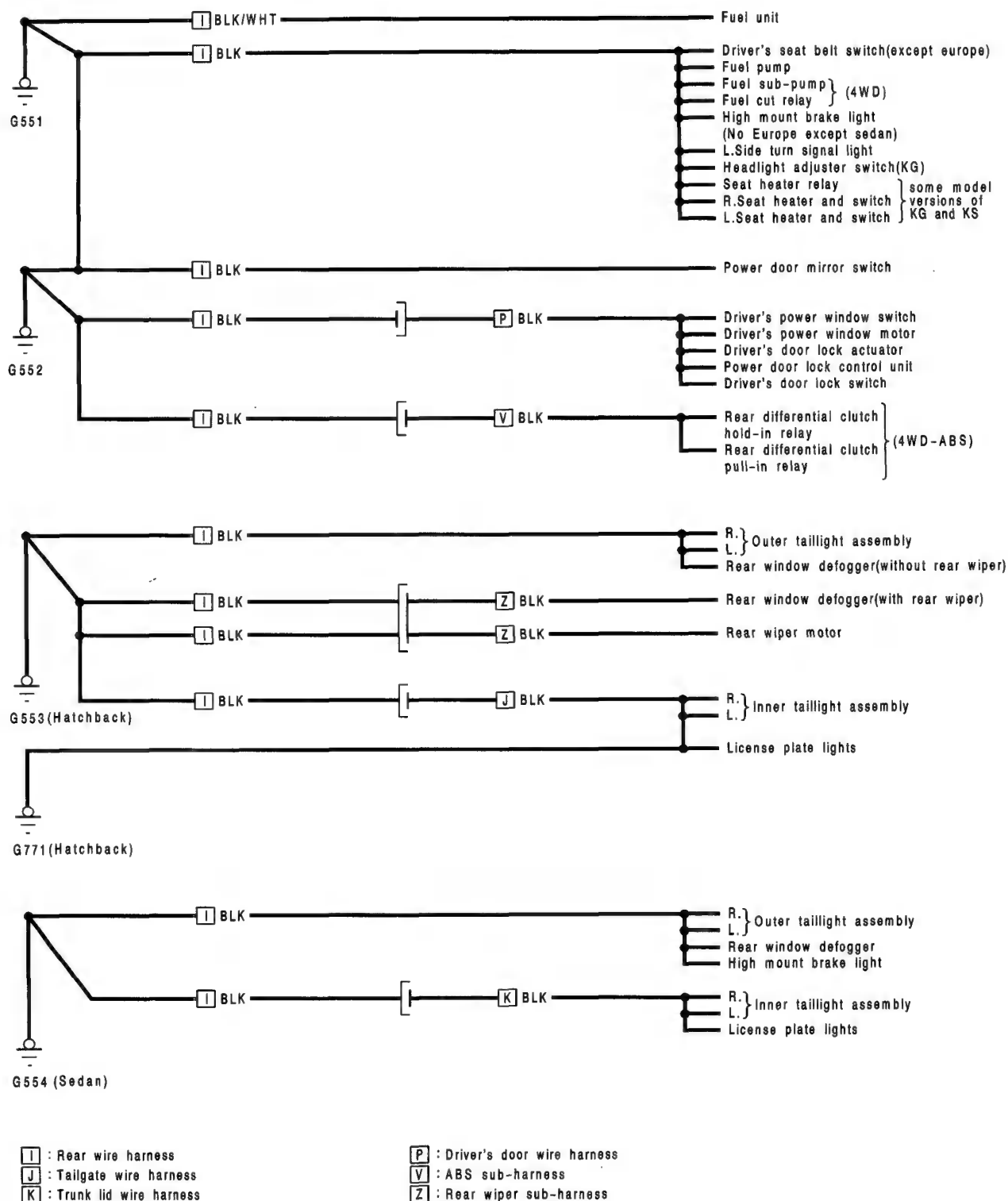


(From page23-64)



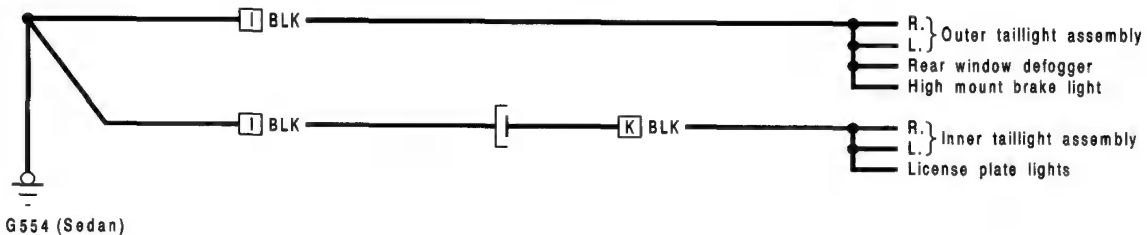
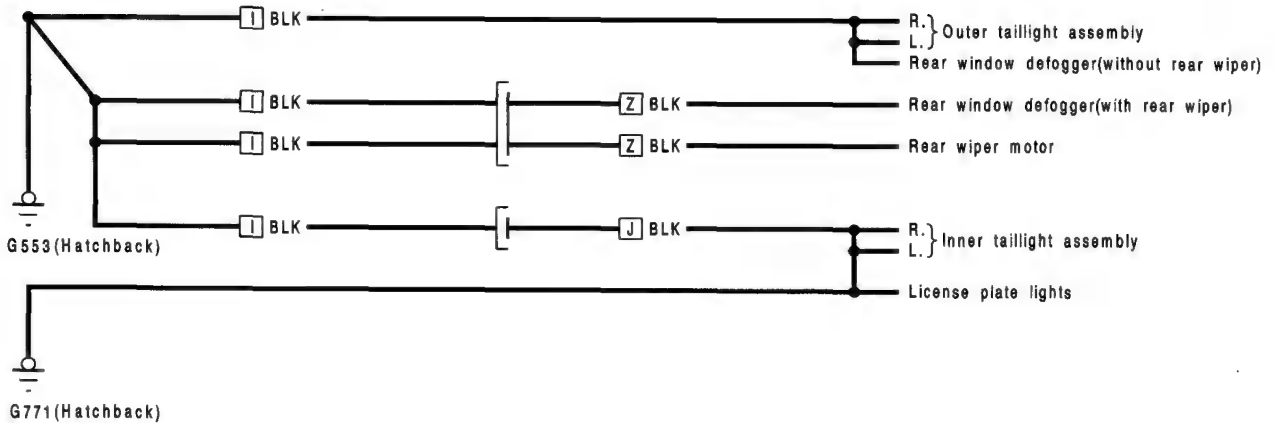
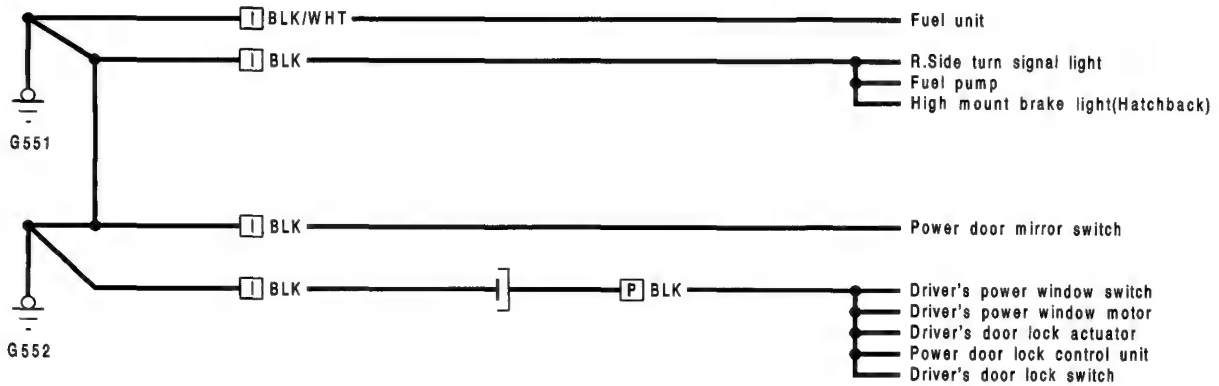
Ground Distribution

Circuit Identification (LHD)





(RHD)



I : Rear wire harness
J : Tailgate wire harness
K : Trunk lid wire harness

P : Driver's door wire harness
Z : Rear wiper sub-harness

Ground Distribution

Circuit Identification



- H** : Dashboard wire harness
- O** : SRS unit sub-harness
- AA** : A/C wire harness

Battery



Test

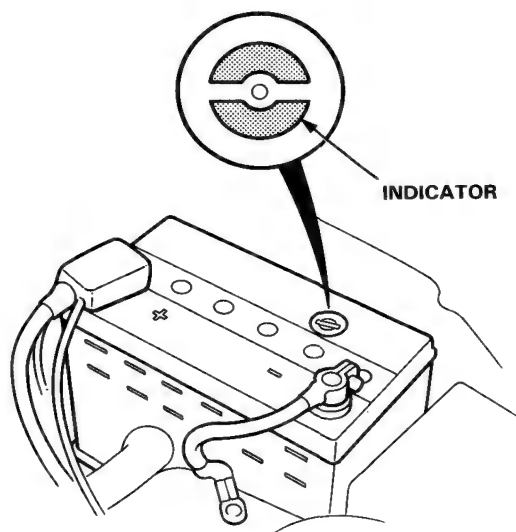
⚠ WARNING

- **Battery fluid (electrolyte) contains sulfuric acid. It may cause severe burns if it gets on your skin or in your eyes.**
Wear protective clothing and a face shield.
 - If electrolyte gets on your skin or clothes, rinse it off with water immediately.
 - If electrolyte gets in your eyes, flush it out by splashing water in your eyes for at least 15 minutes; call a physician immediately.
- **A battery gives off hydrogen gas. If ignited, the hydrogen will explode and could crack the battery case and splatter acid on you. Keep sparks, flames, and cigarettes away from the battery.**
- **Overcharging will raise the temperature of the electrolyte. This may force electrolyte to spray out of the battery vents. Follow the charger manufacturer's instructions and charge the battery at a proper rate.**

NOTE: To get accurate results, the temperature of the electrolyte must be between 15 and 38°C (59 and 100°F) before testing.

Test Equipment Required:

- **Battery tester with:**
Voltmeter with 0–18 V scale, ammeter with 0–100 A and 0–500 A scales, and a carbon pile with 0–300 W.
- **12 V Battery charger:**
Fast charge capability of 50 A and slow charge capability of 5 A.



Test Procedure:

1. Check for damage: If the case is cracked or the posts are loose, replace the battery.
2. Check the indicator (for basic charge condition): Blue or Green is OK. If the indicator is Red, peel the tape off, remove the caps, and add distilled water; then reinstall the caps and tape. If the indicator is clear, go to step 3.
3. Test the battery load capacity by connecting a battery tester and applying a load of 3 times the battery ampere hour rating.
When the load has been applied for exactly 15 seconds, the battery voltage reading should stay above 9.6 V.
 - If the reading stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the reading is between 6.5 and 9.6 V, fast charge the battery by connecting a battery charger for 3 minutes at an initial rate of 40 amps.

CAUTION: Amperage will drop as voltage increases; do not increase the amperage to compensate or you may damage the battery.

Watch the battery voltage during the entire 3 minutes; the highest reading should stay below 15.5 V.

- If the reading stays below 15.5 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the reading exceeds 15.5 V at any time during the 3 minutes of fast charging, the battery is not good; replace it.
- If the reading drops below 6.5 V, slow charge the battery by connecting a battery and charge at 5 amps for no more than 24 hours (or until the indicator shows full charge, or the specific gravity of the electrolyte is at least 1.270). Then test the load capacity again.
- If the voltage stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the voltage still drops below 6.5 V, the battery is not good; replace it.

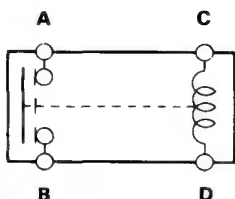
Power Relays

Relay Test

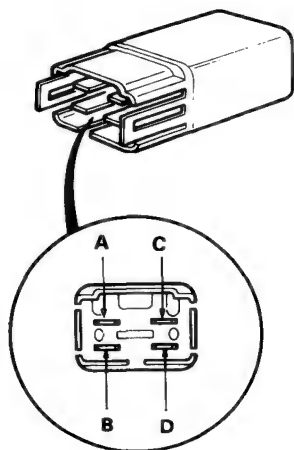
NORMALLY OPEN type:

NOTE: See page 23-236 for turn signal/hazard relay input test.

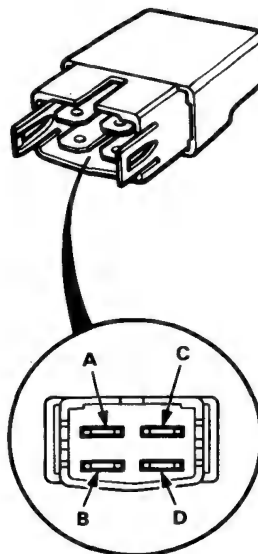
1. Remove the power relay from its socket.
2. There should be continuity between the C and D terminals.
3. There should be continuity between the A and B terminals when the battery is connected to the C and D terminals. There should be no continuity when the battery is disconnected.



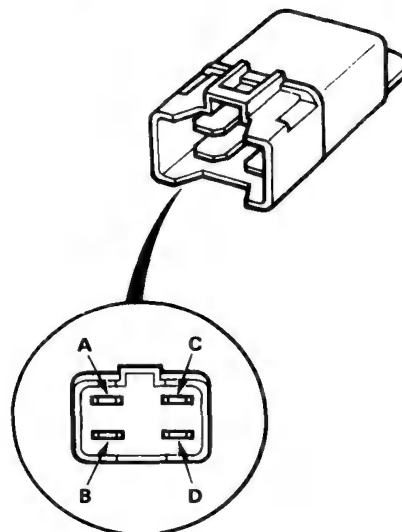
- Power window relay
- Cooling (Radiator) fan relay
- Rear window defogger relay
- Heater motor relay



- ABS front fail-safe relay
- ABS rear fail-safe relay

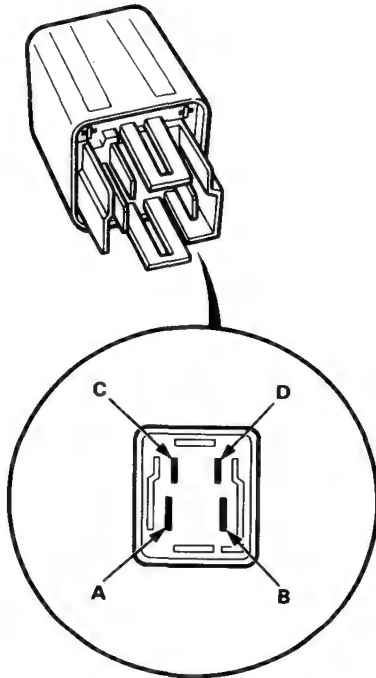


- Seat heater main relay
 - Condenser fan relay
 - A/C compressor clutch relay
 - Rear differential clutch pull-in relay
 - Rear differential clutch hold-in relay
- } (4WD-ABS)



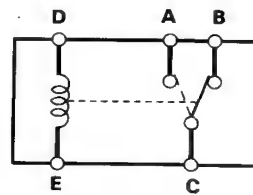


- ABS motor relay

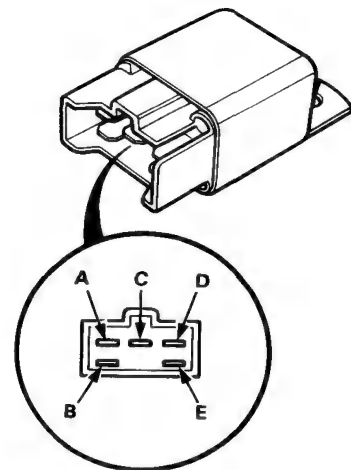


FIVE-TERMINAL type:

1. Remove the power relay from its socket.
2. There should be continuity between the A and C terminals when the battery is connected to the D and E terminals.
There should be continuity between the B and C terminals when the battery is disconnected.



- Sunroof open relay
- Sunroof close relay

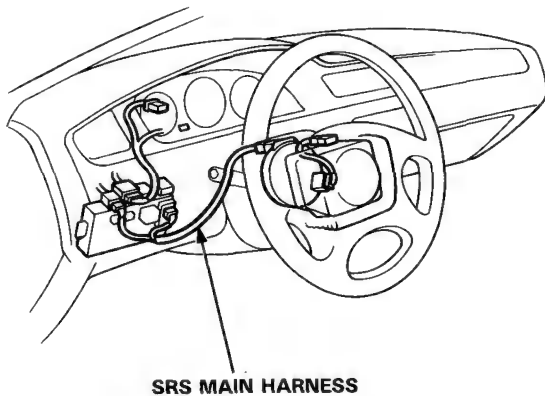


Under-Dash Fuse box

Removal/Installation

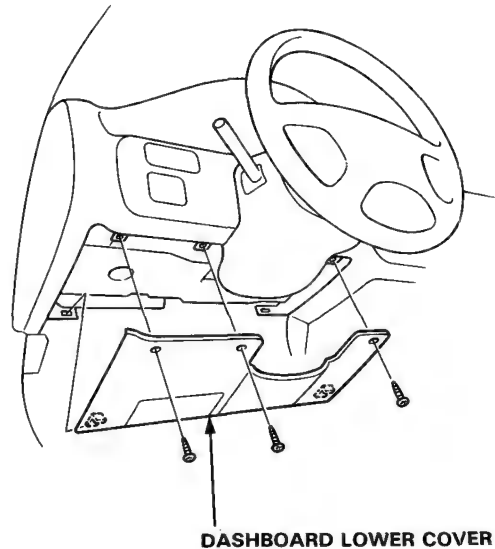
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



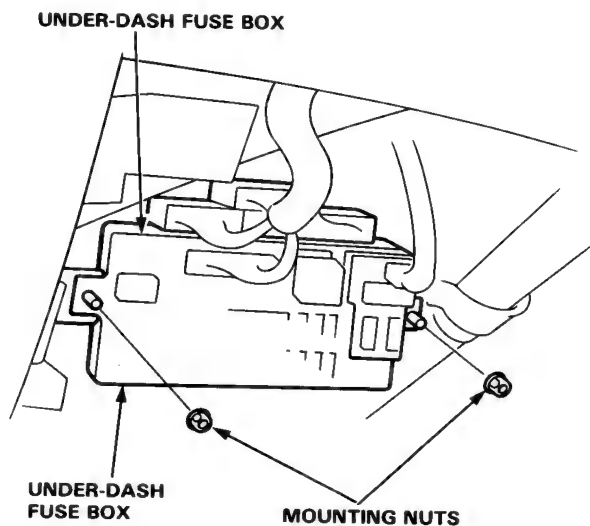
Removal:

1. Disconnect the negative and positive battery cables, and wait at least three minutes.
2. Remove the dashboard lower cover.

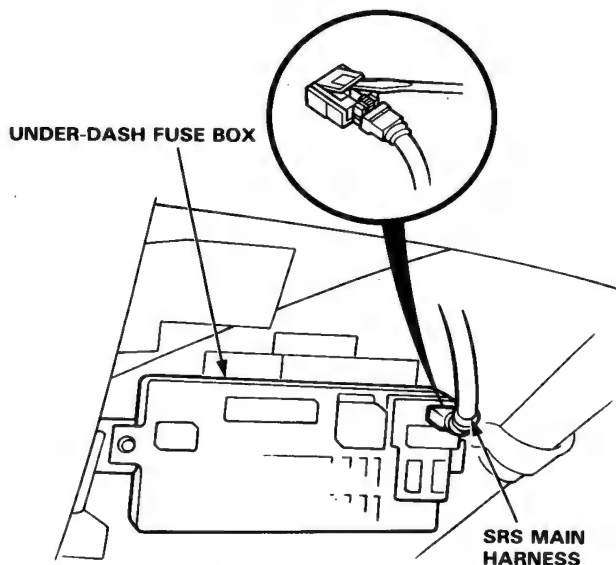




3. Remove the mounting nuts and pull the fuse box out from under the dash.



4. Disconnect the fuse box connectors and take out the fuse box.



NOTE: The SRS main wire harness connector is double-locked. To remove it, first lift the connector lid, then press the connector tab down and pull the connector out.

Installation:

1. Reconnect the connectors to the fuse box.

NOTE: To reinstall the SRS main wire harness connector, push it into position until it clicks, then close the connector lid.

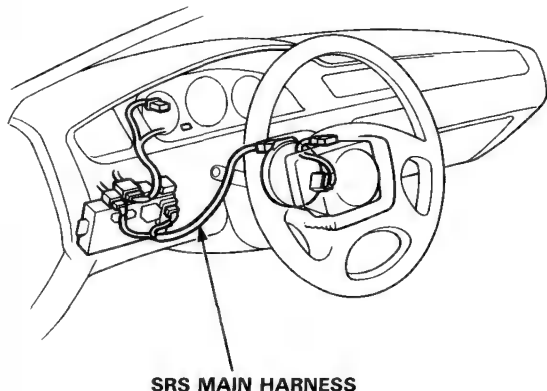
2. Install the fuse box.
3. Reinstall the dashboard lower cover.
4. Connect both the negative cable and positive cable to the battery.
5. Confirm that all systems work properly.

Ignition Switch

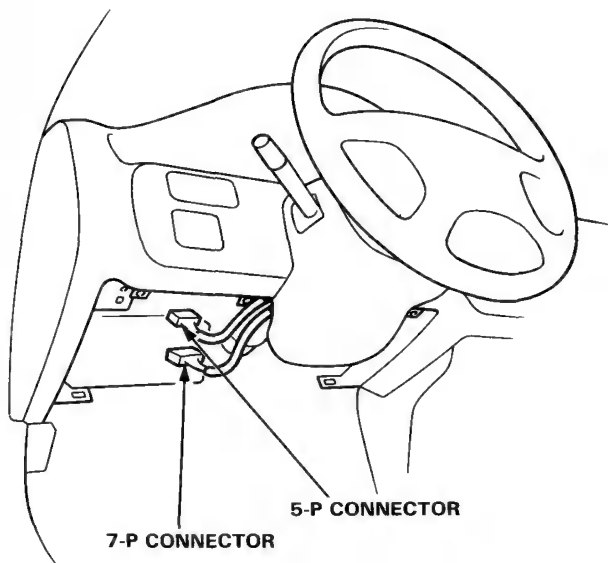
Test

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



1. Remove the dashboard lower cover (see page 23-70).
2. Disconnect the 5-P and 7-P connectors from the under-dash fuse box.

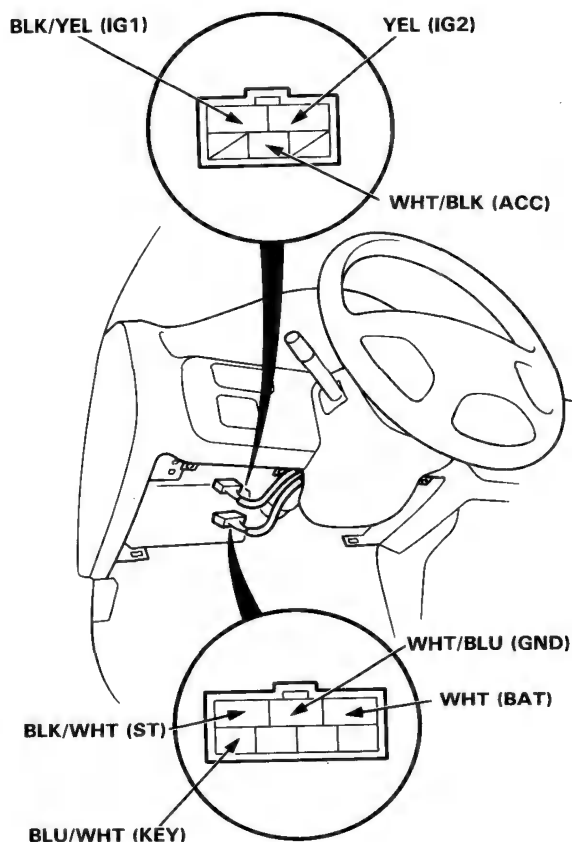


3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	WHT/ BLK (ACC)	WHT (BAT)	BLK/ YEL (IG1)	YEL (IG2)	BLK/ WHT (ST)	BLU/ WHT (KEY)	WHT/ BLU (GND)
O							
I	○—○						
II	○—○	○—○	○—○	○—○			
III		○—○	○—○	○—○	○—○		
Key in						○—○	○—○

4. If continuity checks do not agree with the table, replace the steering lock assembly.

View from wire side



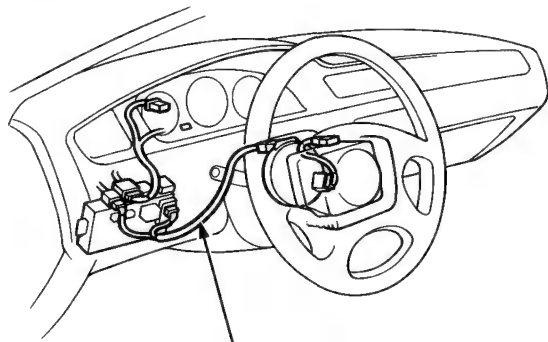
View from wire side



Steering Lock Replacement

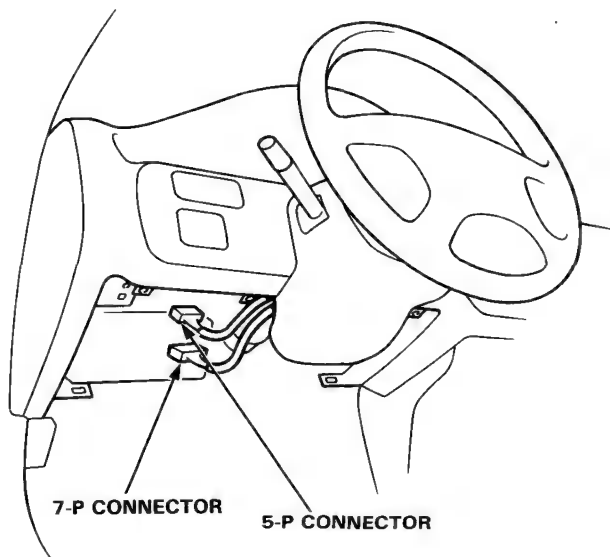
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

1. Disconnect the negative and positive battery cables, and wait at least three minutes.
2. Remove the dashboard lower cover (see page 23-70).
3. Disconnect the 5-P and 7-P connectors from the under-dash fuse box.



7-P CONNECTOR

5-P CONNECTOR

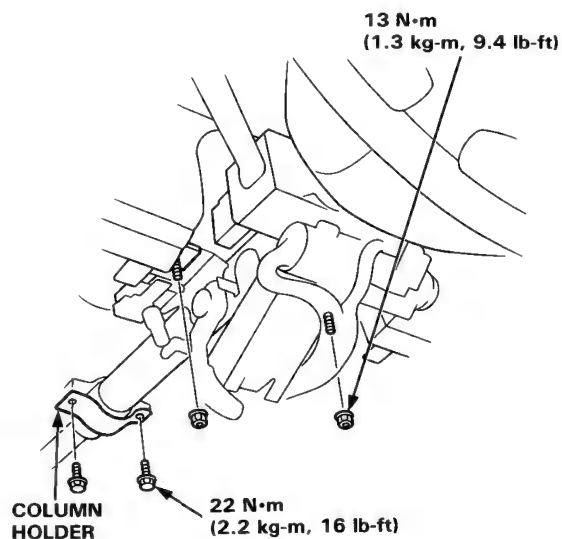
4. Remove the steering column covers.



UPPER COVER

LOWER COVER

5. Remove the column holder mounting bolts and nuts.



13 N·m
(1.3 kg-m, 9.4 lb-ft)

COLUMN
HOLDER

22 N·m
(2.2 kg-m, 16 lb-ft)

6. Lower the steering column assembly.

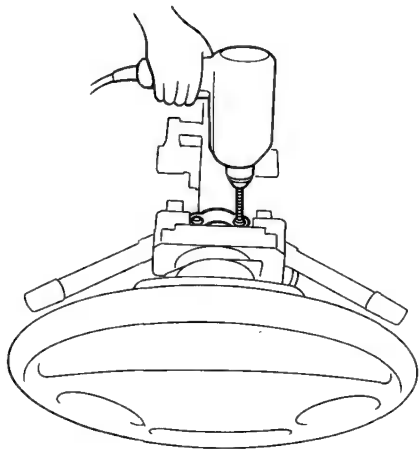
(cont'd)

Ignition Switch

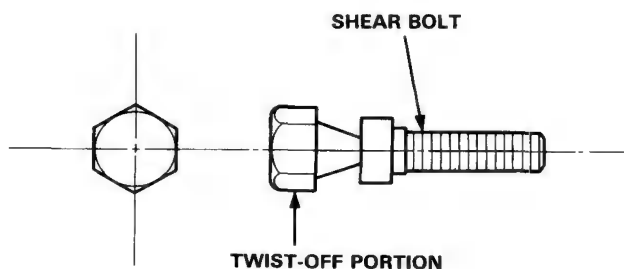
Steering Lock Replacement (cont'd)

7. Center punch each of the 2 shear bolts and drill their heads off with a 3/16 in. drill bit.

CAUTION: Do not damage the switch body when removing the shear bolts.



8. Remove the shear bolts from the switch body.
9. Install the new ignition switch without the key inserted.
10. Loosely tighten the new shear bolts.
11. Insert the ignition key and check for proper operation of the steering wheel lock and that the ignition key turns freely.
12. Tighten the shear bolts until the hex heads twist off.



Starting System

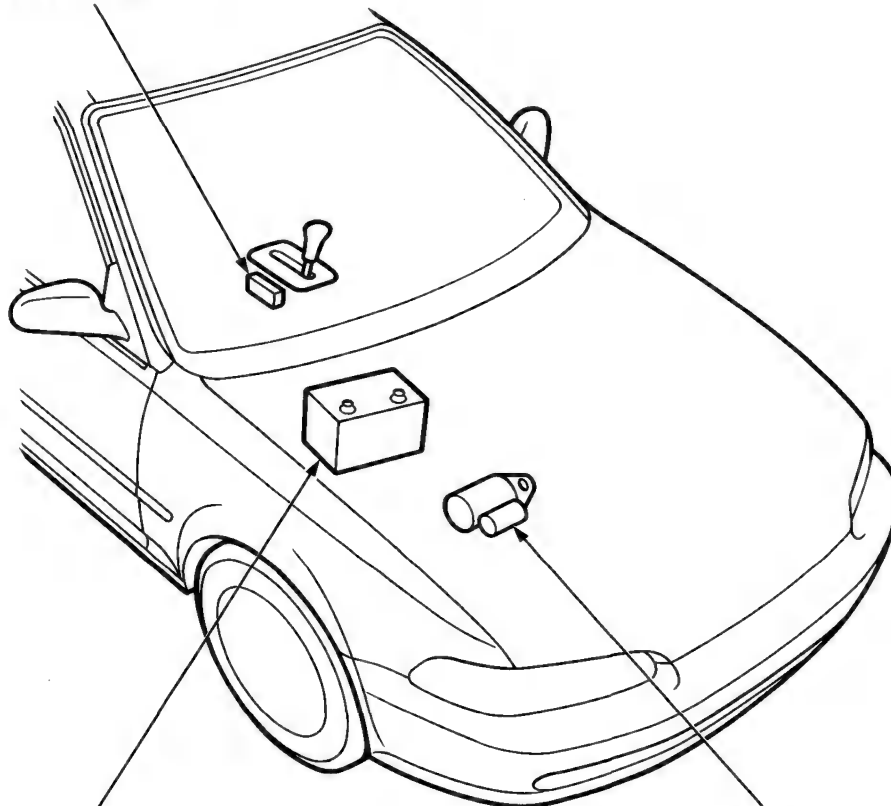


Component Location Index

SHIFT POSITION CONSOLE SWITCH (A/T)

Test, page 23-182

Replacement, page 23-183



BATTERY

Test, page 23-69

STARTER

Test, page 23-80

Solenoid Test, page 23-82 and 84

Replacement, page 23-82

Overhaul, pages 23-85 thru 88

Reassembly, page 23-94

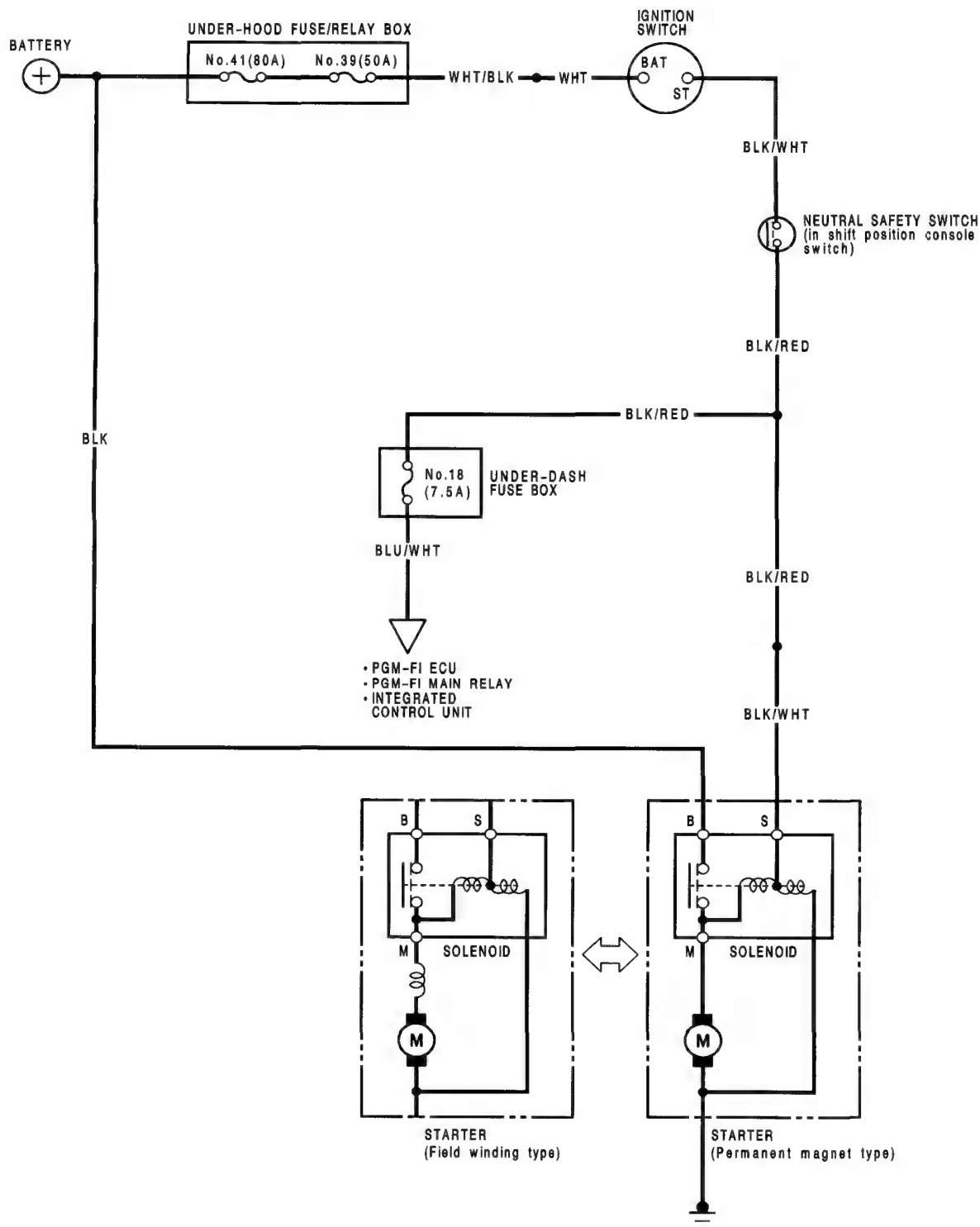
Description

Permanent Magnet Type Starter:

In some versions the previously used field winding inside the armature housing has been replaced with a permanent magnet to reduce weight and increase reliability.

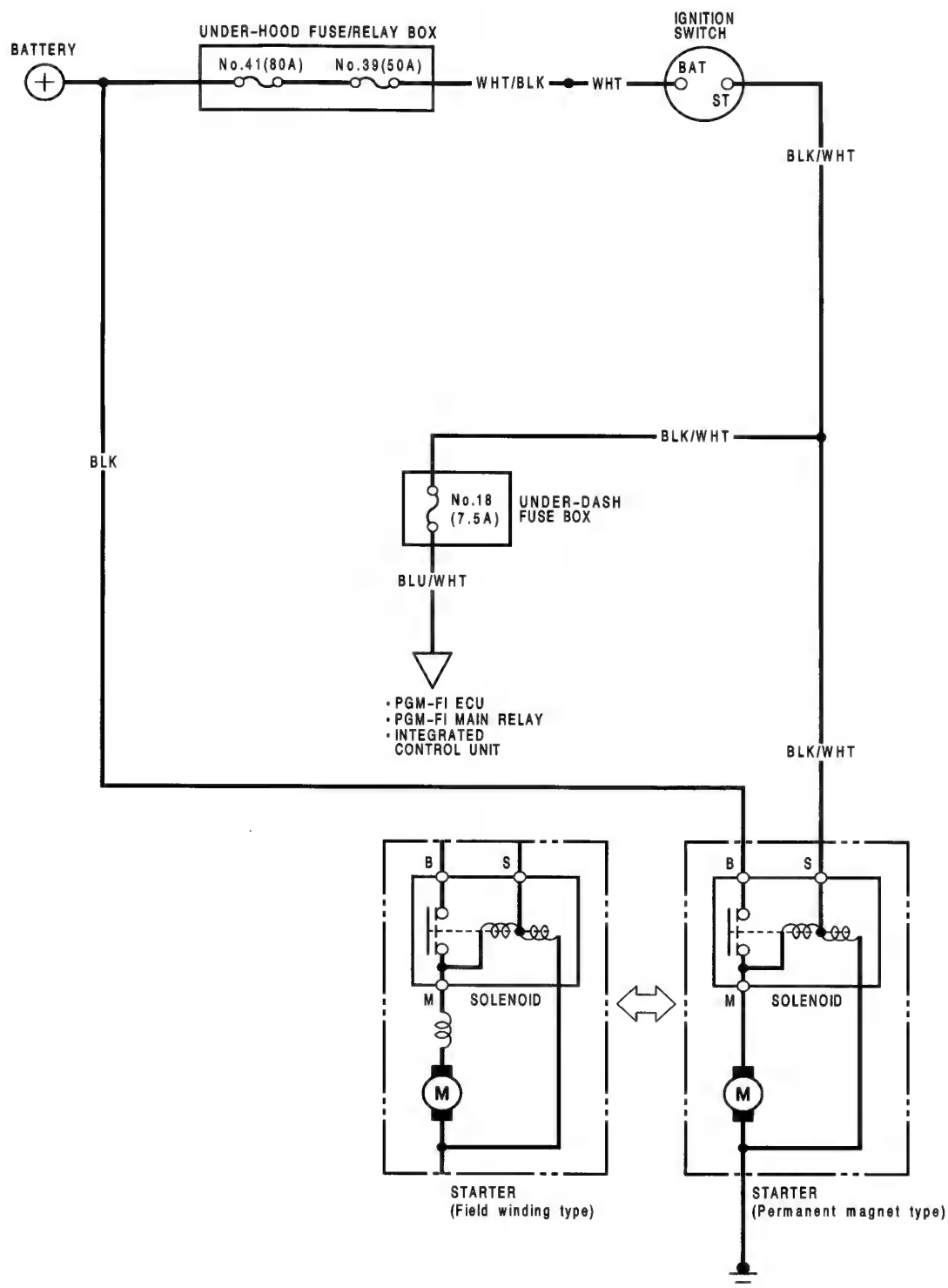
Starting System

Circuit Diagram (A/T)





Circuit Diagram (M/T)



Starting System

Starter Test

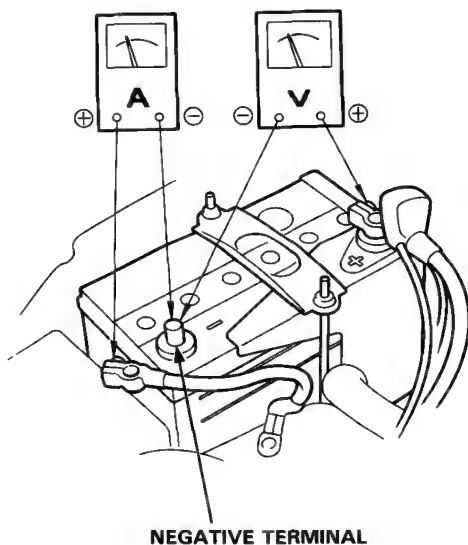
NOTE: The air temperature must be between 15 and 38°C (59 and 100°F) before testing.

Recommended Procedure:

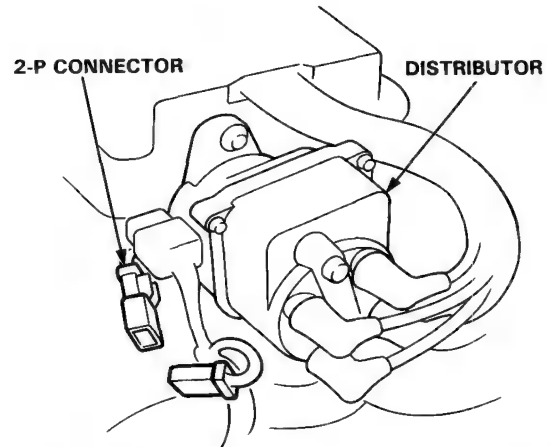
- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.
- Test and troubleshoot as described.

Alternate Procedure:

- Use the following equipment:
 - Ammeter, 0–400 A
 - Voltmeter, 0–20 V (accurate within 0.1 volt)
 - Tachometer, 0–1200 rpm
- Hook up voltmeter and ammeter as shown.



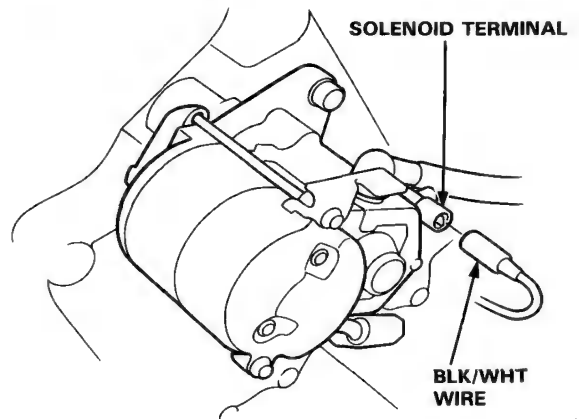
1. Disconnect the 2-P connector (ignition coil primary lead) from the distributor.



2. Check the starter engagement:
Turn the ignition switch to "Start". The starter should crank the engine.

- If the starter does not crank the engine, check the battery, battery positive cable, ground, and the wire connections for looseness and corrosion.

- Test again.
If the starter still does not crank the engine, bypass the ignition switch circuit as follows (make sure the transmission is in neutral):
Unplug the connector (BLK/WHT wire and solenoid terminal wire) from the starter. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.





— If the starter still does not crank the engine, remove the starter and diagnose its internal problems.

— If the starter cranks the engine, check for an open in the BLK/WHT wire circuit between the starter and ignition switch, and the connectors. Check the ignition switch.

On cars with automatic transmission, check the shift position console switch (neutral safety switch) and connector.

On cars with manual transmission, check the starter cut relay, clutch interlock switch, and connectors.

NOTE: Check the No. 39 (50A) fuse and the starter cut relay.

3. Check for wear or damage:
The starter should crank the engine smoothly and steadily.

If the starter engages, but cranks the engine erratically, remove the starter motor. Inspect the starter, drive gear and flywheel ring gear for damage.

Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held. Replace the gears if damaged.

4. Check cranking voltage and current draw:
Voltage should be no less than 8.0 volts.
Current should be no more than 400 amperes.

If voltage is too low, or current draw too high, check for:

- Fully charged battery.
- Open circuit in starter armature commutator segments.
- Starter armature dragging.
- Shorted armature winding.
- Excessive drag in engine.

5. Check cranking rpm:
Engine speed during cranking should be above 100 rpm.

If speed is too low, check for:

- Loose battery or starter terminals.
- Excessively worn starter brushes.
- Open circuit in commutator segments.
- Dirty or damaged helical spline or drive gear.
- Defective drive gear overrunning clutch.

6. Check the starter disengagement:
Turn the ignition switch to "III" and release to "II". The starter drive gear should disengage from the flywheel ring gear.

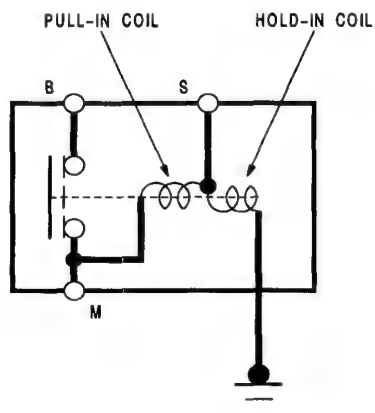
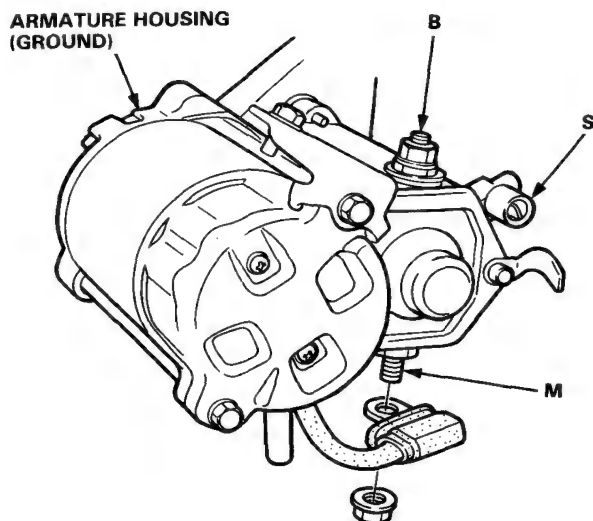
If the drive gear hangs up on the flywheel ring gear, check for:

- Solenoid plunger and switch malfunction.
- Dirty drive gear assembly or damaged overrunning clutch.

Starting System

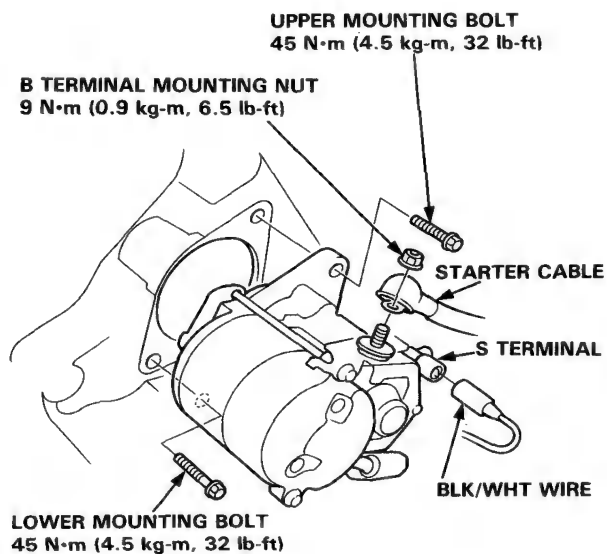
Starter Solenoid Test (Nippondenso)

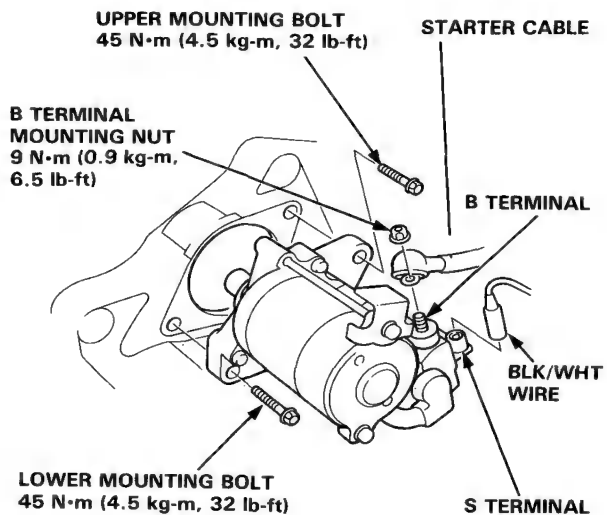
1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground).
Coil is OK if there is continuity.
2. Check the pull-in coil for continuity between the S and M terminals.
Coil is OK if there is continuity.



Starter Replacement

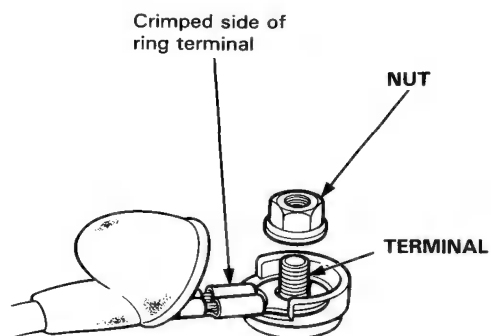
1. Disconnect the negative cable from the battery.
2. Disconnect the starter cable from the B terminal on the solenoid, then the BLK/WHT wire from the S terminal.
3. Remove the 2 bolts holding the starter, and remove the starter.





4. Install in the reverse order of removal.

NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out.

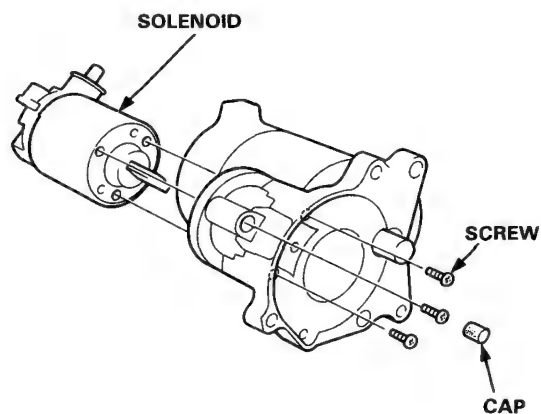
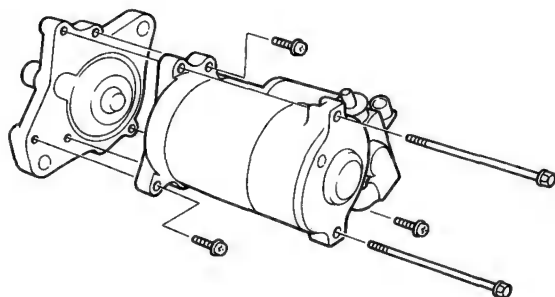


Starting System

Starter Solenoid Test (Mitsuba and Hitachi)

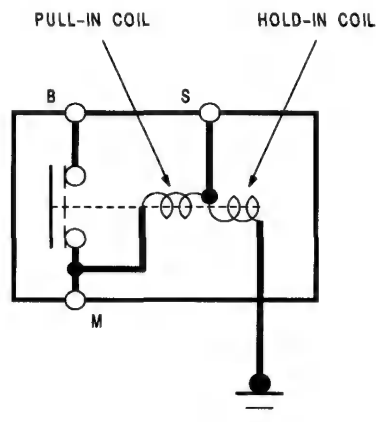
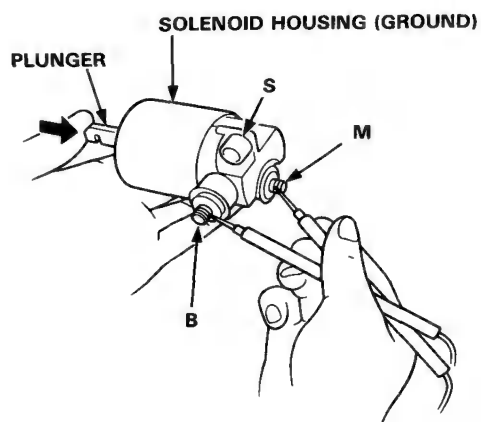
NOTE: The illustration shows Mitsuba type.

1. Remove the starter solenoid from the gear housing cover.



2. Check for continuity between the terminals in each solenoid plunger position according to the table.

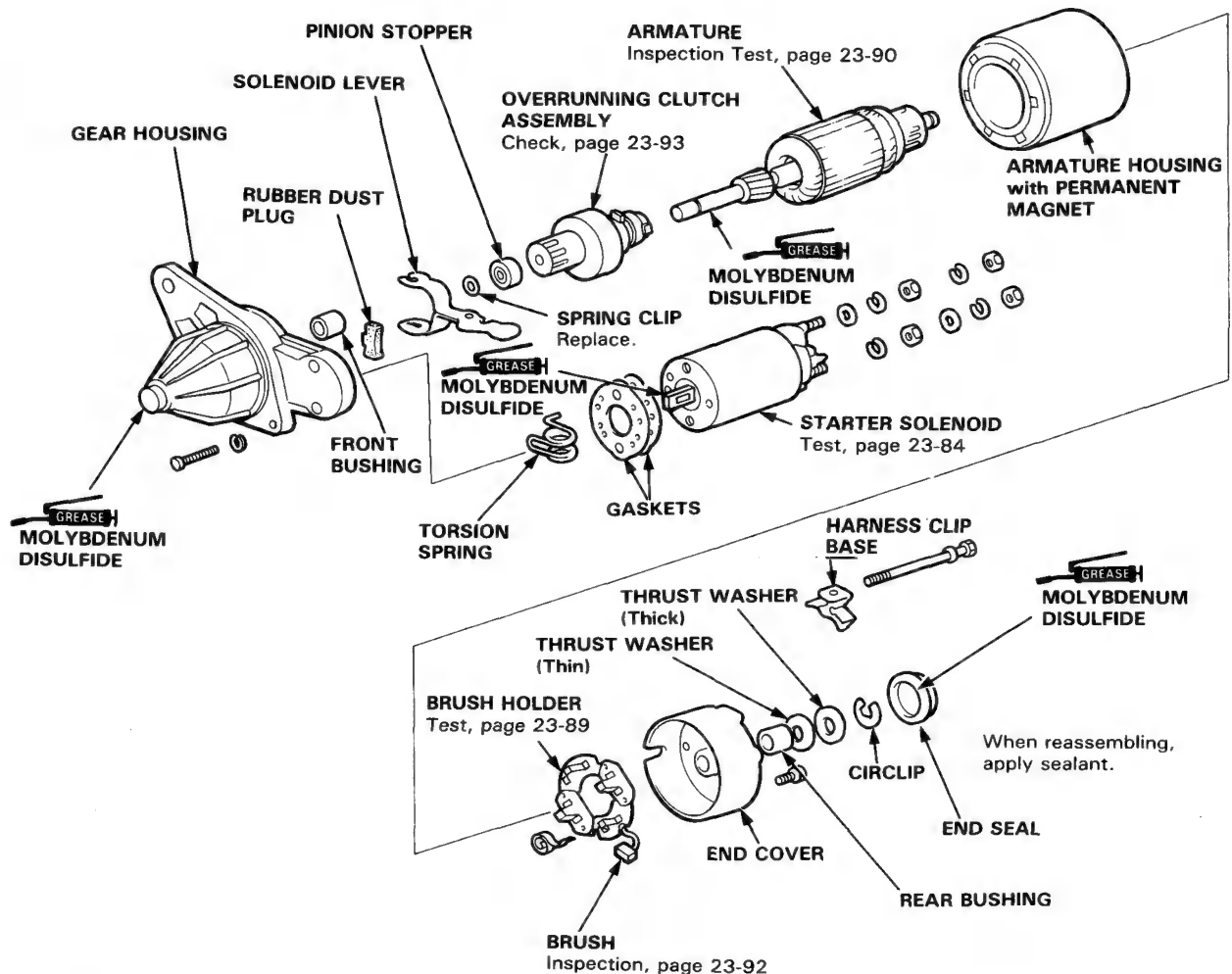
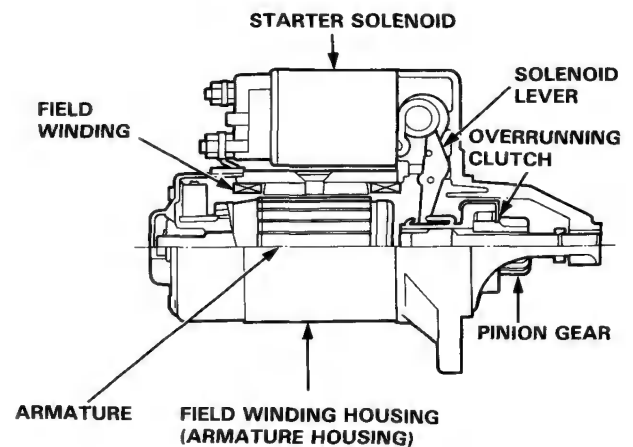
Terminal Position	B	M	S	GROUND
RELEASED		○	○	○
PUSHED	○	○	○	○





Starter Overhaul (Hitachi)

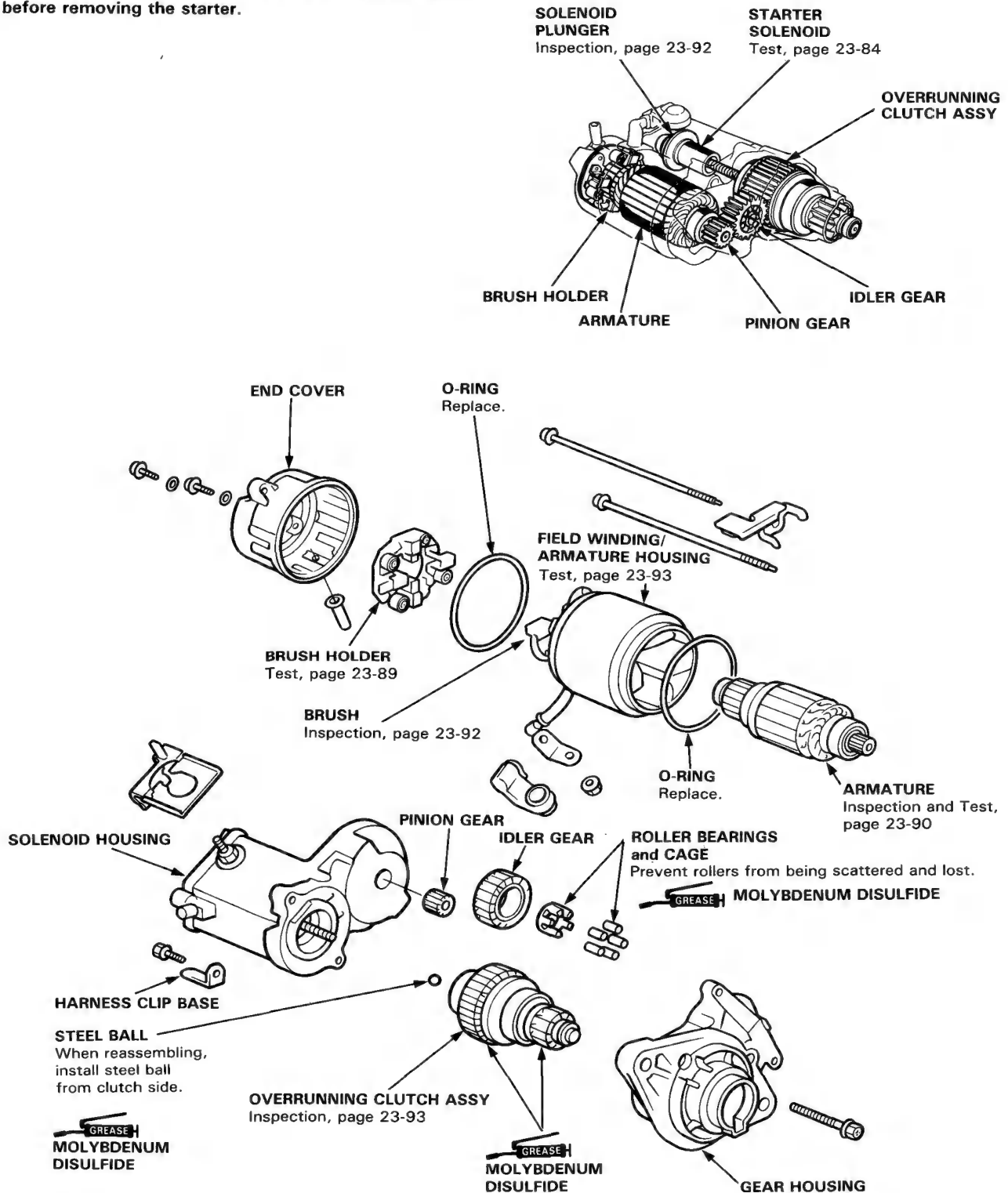
CAUTION: Disconnect the battery negative cable before removing the starter.



Starting System

Starter Overhaul (Nippondenso)

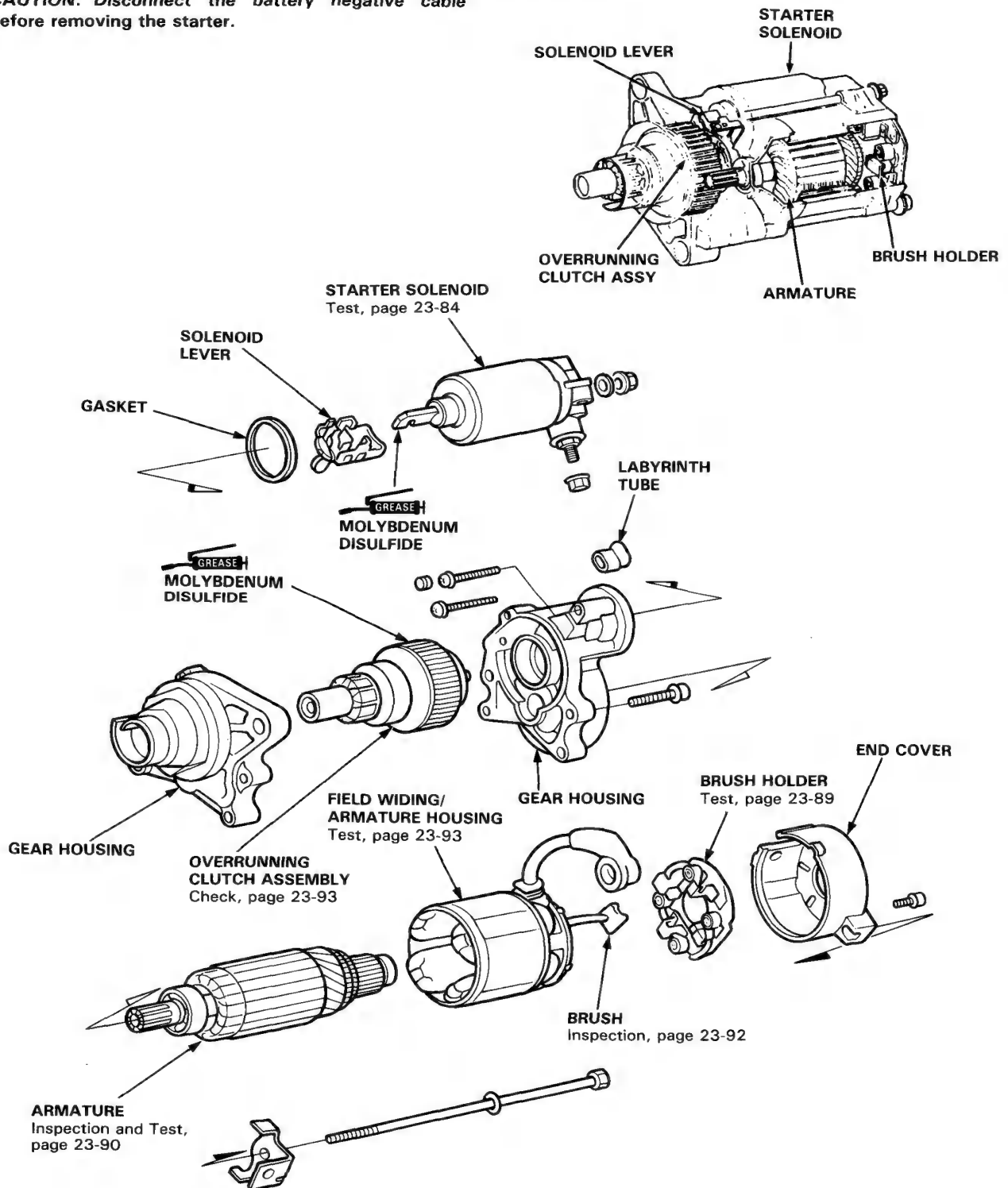
CAUTION: Disconnect the battery negative cable before removing the starter.





Starter Overhaul (Mitsuba: Field Winding Type)

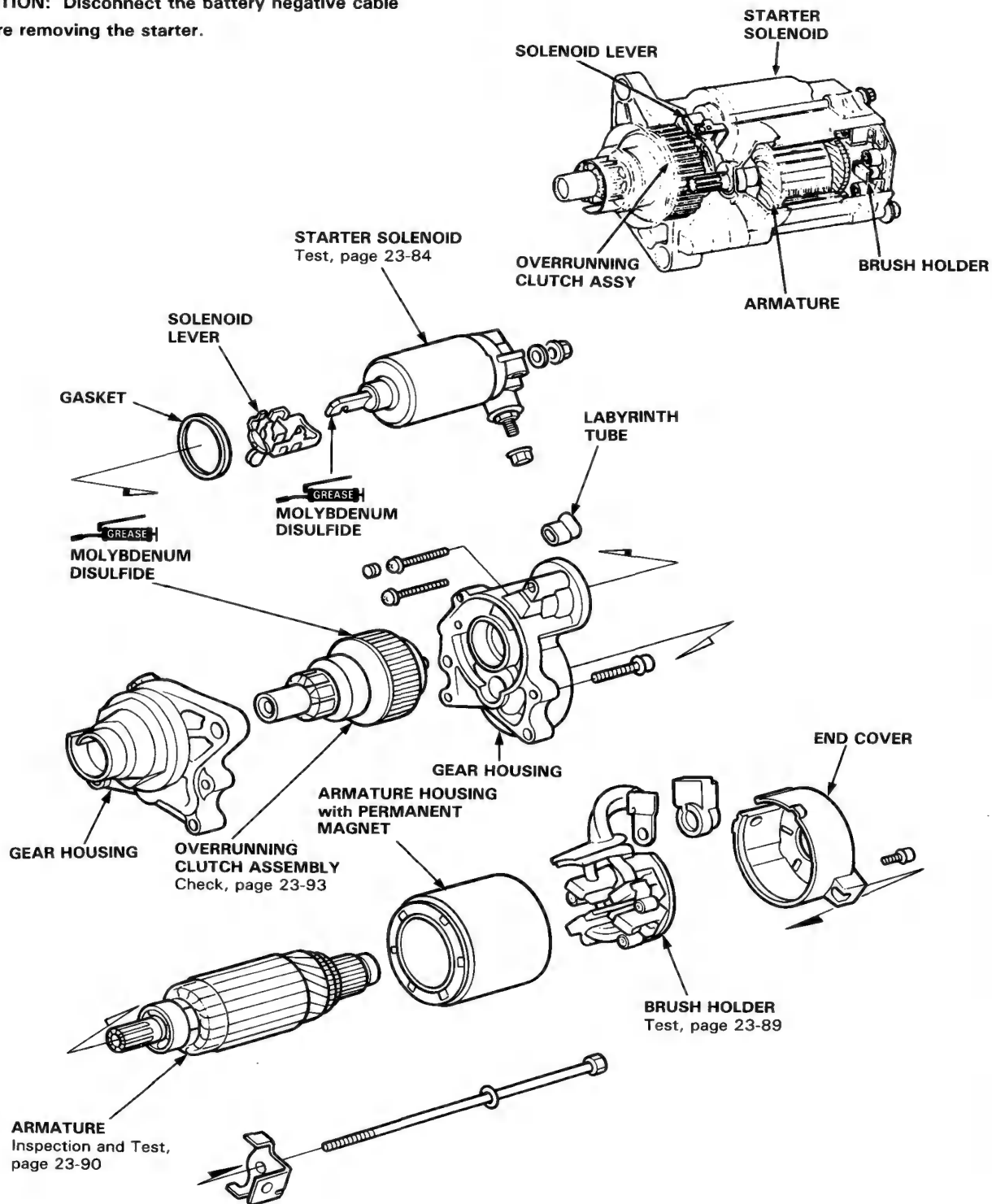
CAUTION: Disconnect the battery negative cable before removing the starter.



Starting System

Starter Overhaul (Mitsuba: Permanent Magnet Type)

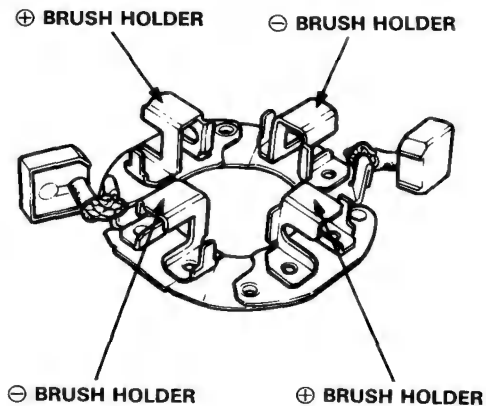
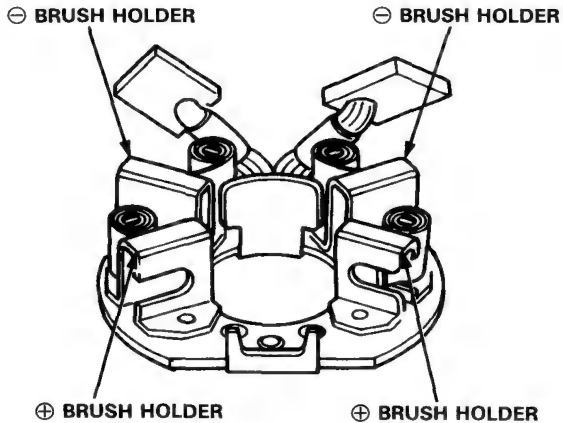
CAUTION: Disconnect the battery negative cable before removing the starter.



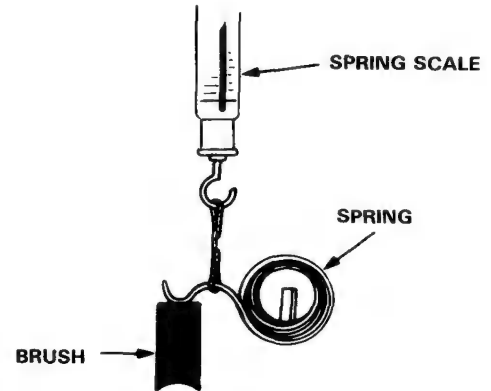


Starter Brush Holder Test

1. Check that there is no continuity between the \oplus and \ominus brush holders.
If continuity exists, replace the brush holder assembly.



2. Insert the brush into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale to the spring. Measure the spring tension at the moment the spring lifts off the brush.



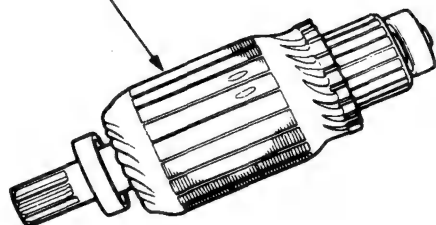
	Spring Tension
Hitachi (0.8 KW)	13 N (1.30 kg, 2.86 lb)
Nippondenso (1.0 KW)	17–24 N (1.70–2.40 kg, 3.74–5.28 lb)
Nippondenso (1.2 KW)	14–20 N (1.40–2.0 kg, 3.08–4.4 lb)
Mitsuba (1.0, 1.2 KW)	18.5–23.5 N (1.85–2.35 kg, 4.07–5.17 lb)
Mitsuba (1.4 KW)	16–18 N (1.60–1.80 kg, 3.52–3.96 lb)

Starting System

Armature Inspection and Test

1. Inspect the armature for wear or damage due to contact with the field coil magnets.

Inspect for damage

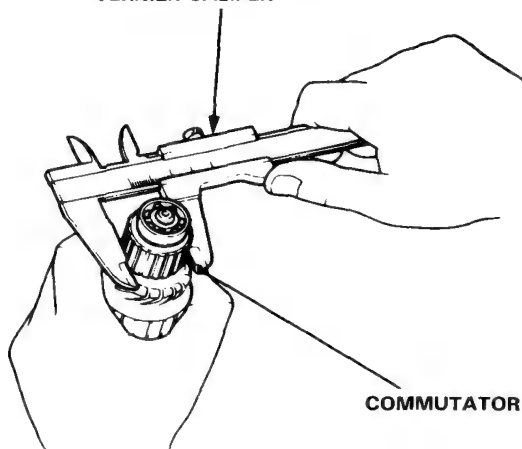


2. A dirty or burnt commutator surface may be resurfaced with emery cloth or a lathe within the following specifications.

Commutator Diameter

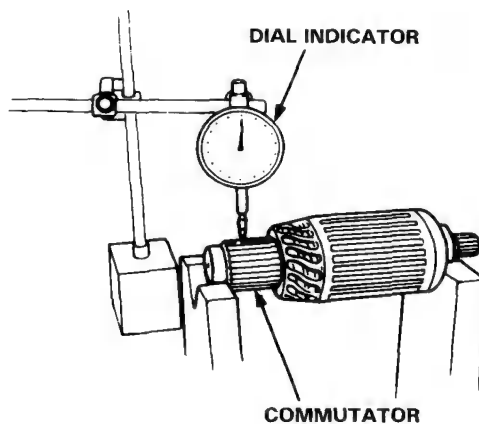
	Standard (NEW)	Service Limit
Hitachi	40.0 mm (1.57 in)	39.0 mm (1.54 in)
Nippondenso	30.0 mm (1.18 in)	29.0 mm (1.14 in)
Mitsuba	28.0–28.1 mm (1.102–1.106 in)	27.5 mm (1.083 in)

VERNIER CALIPER



Commutator Runout

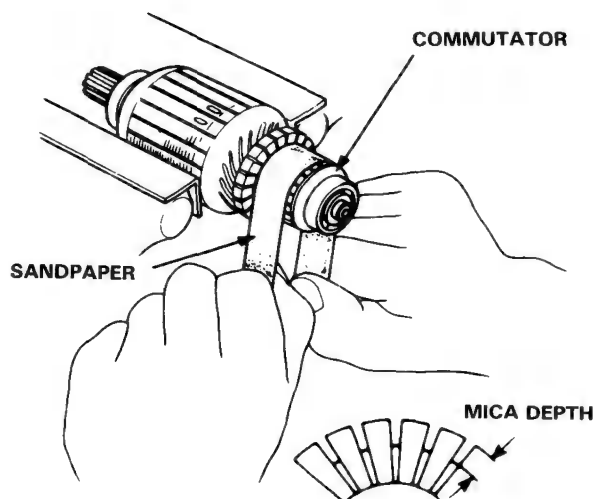
	Standard (NEW)	Service Limit
Hitachi and Mitsuba	0–0.02 mm (0.0008 in)	0.05 mm (0.002 in)
Nippondenso	0–0.1 mm (0.004 in)	0.4 mm (0.015 in)



3. If the commutator runout and diameter are within limits, check the commutator for damage or for carbon dust or brass chips between the segments.



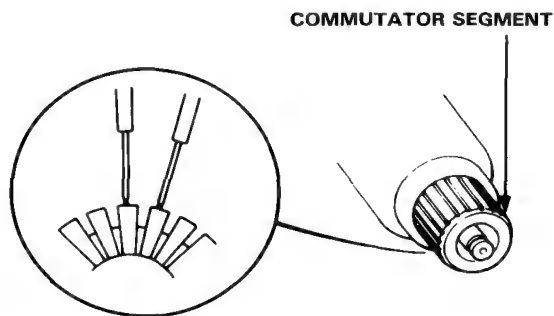
4. If the surface is dirty, recondition it with a #500 or #600 sandpaper. Then, check mica depth. If necessary, undercut mica with a hacksaw blade to achieve proper depth.



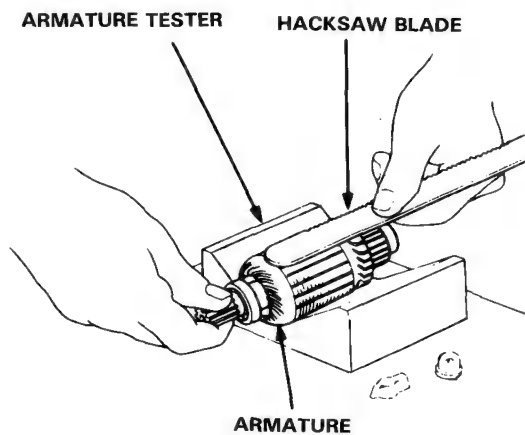
Commutator Mica Depth

	Standard (NEW)	Service Limit
Hitachi and Nippondenso	0.5–0.8 mm (0.02–0.03 in)	0.02 mm (0.008 in)
Mitsuba	0.4–0.5 mm (0.016–0.02 in)	0.15 mm (0.006 in)

5. Check for continuity between each segment of the commutator. If an open circuit exists between any segment, replace the armature.

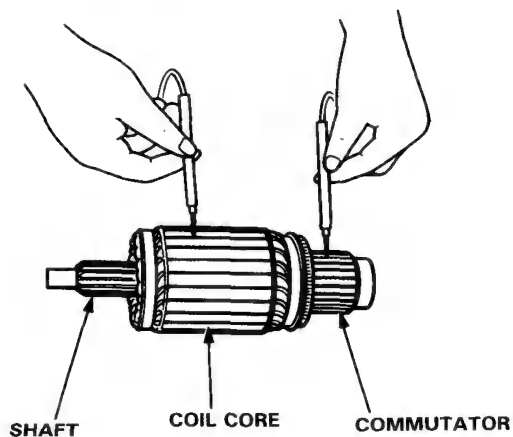


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.

7. Check with an ohmmeter that no continuity exists between the commutator and armature coil core, and between the commutator and armature shaft. If continuity exists, replace the armature.



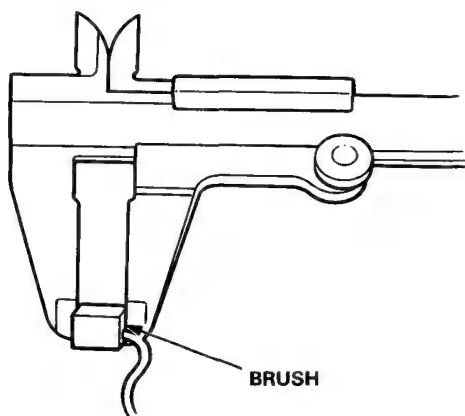
Starting System

Starter Brush Inspection

Measure the brush length. If not within the service limit, replace the armature housing and brush holder assembly.

Brush Length

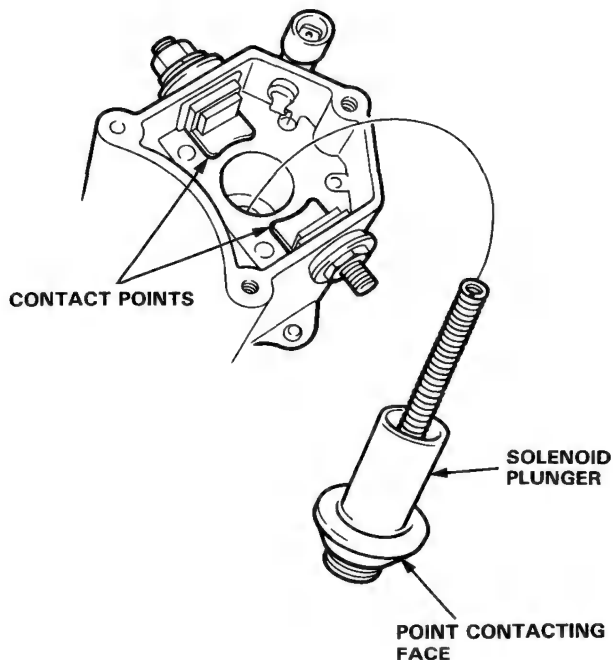
	Standard (NEW)	Service Limit
Hitachi	14.5—15.5 mm (0.57—0.61 in)	11.0 mm (0.43 in)
Nippondenso	13.0—13.5 mm (0.51—0.53 in)	8.5 mm (0.33 in)
Mitsuba	14.3—14.7 mm (0.56—0.58 in)	9.3 mm (0.37 in)



NOTE: To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

Solenoid Plunger Inspection (Nippondenso)

Check the contact points and the face of the starter solenoid plunger for burning, pitting or any other defects. If surfaces are rough, recondition them with a strip of #500 or #600 sandpaper.

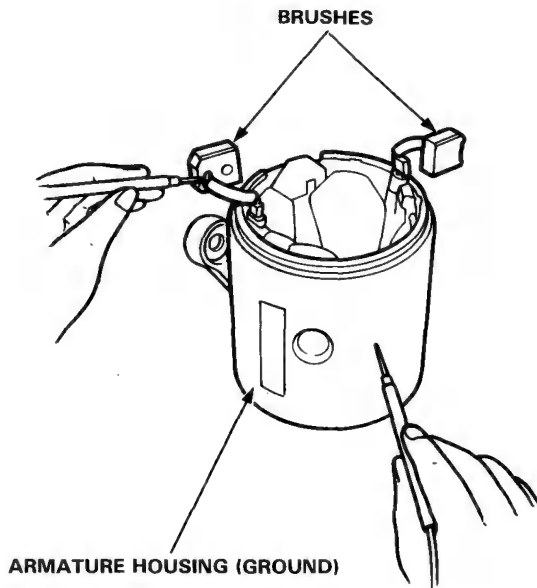




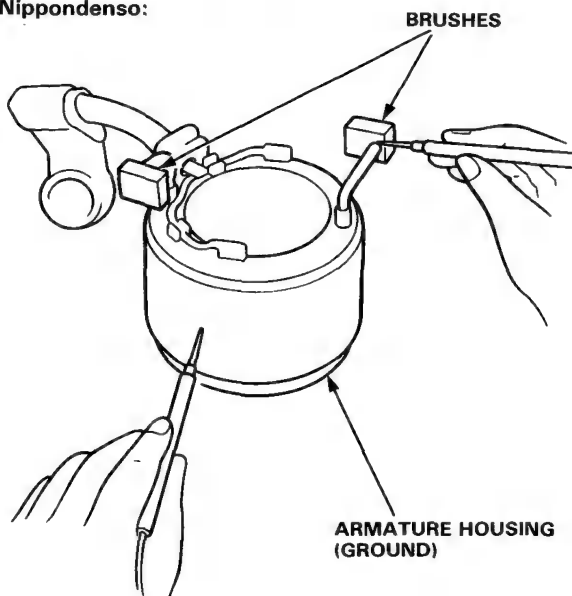
Starter Field Winding Test

1. Check for continuity between the brushes. If there's no continuity, replace the armature housing.
2. Check for continuity between each brush and the armature housing (ground). If continuity exists, replace the armature housing.

Mitsuba (field winding type):

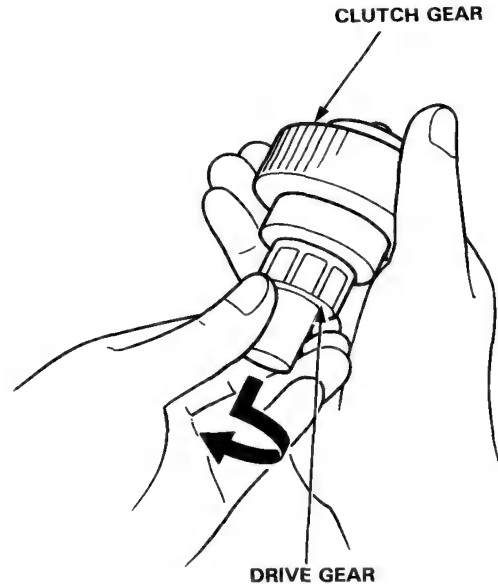


Nippondenso:



Overrunning Clutch Inspection

1. Slide the overrunning clutch along the shaft. Does it move freely? If not, replace it.
2. Rotate the overrunning clutch both ways. Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.



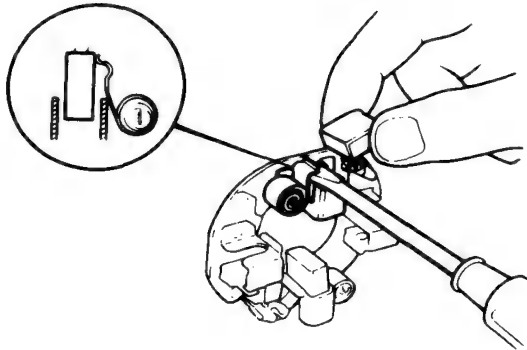
3. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
4. Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

Starting System

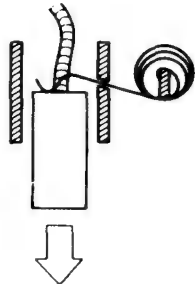
Starter Reassembly

Reassemble the starter in the reverse order of disassembly.

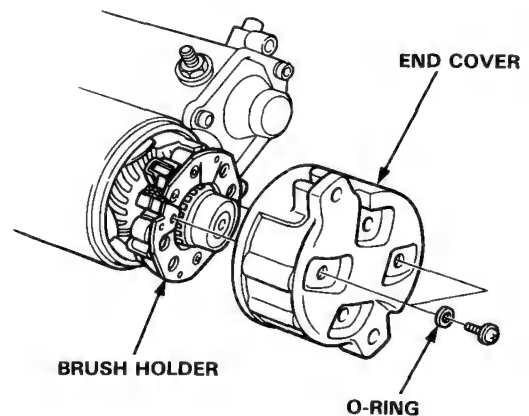
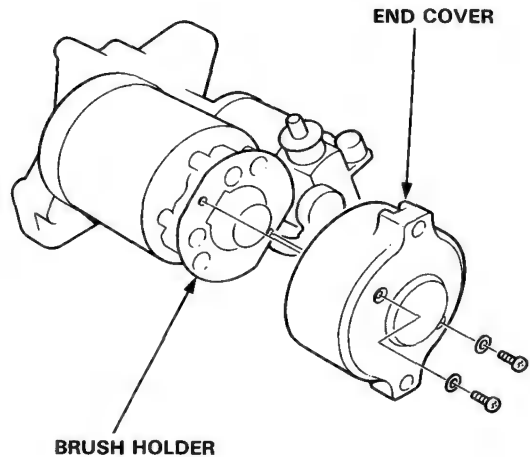
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



2. Install the armature in the housing. Next pry back each brush spring again and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



3. Install the end cover on the brush holder.





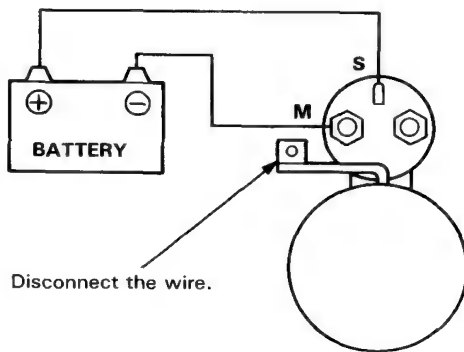
Performance Test

NOTE: Before starting the following checks, disconnect the wire from terminal **M**, and make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the car).

Pull-in Coil Test:

Connect the battery between terminals **S** and **M** on the solenoid. If the pinion protrudes, it is working properly.

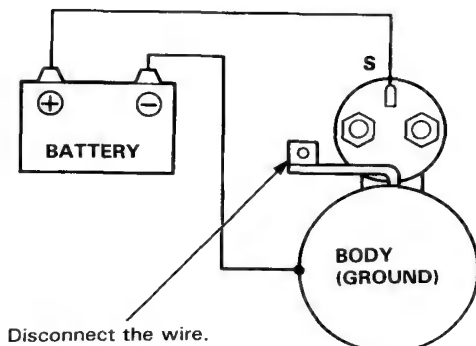
NOTE: Do not leave the battery connected for more than 10 seconds.



Hold-in Coil Test:

Connect the battery between terminal **S** on the solenoid and the body. Manually pull out the pinion until it reaches the pinion stop. If the pinion does not snap back when it is released, the hold-in coil is working properly.

NOTE: Do not leave the battery connected for more than 10 seconds.

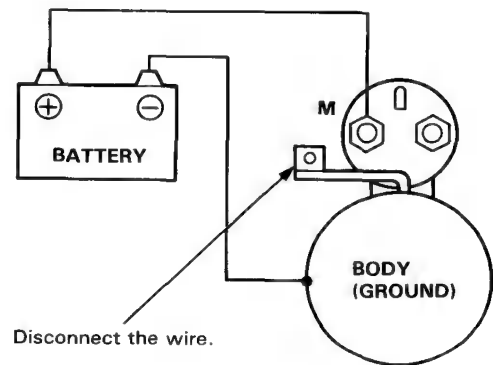


Retracting Test:

Connect the battery between terminal **M** on the solenoid and the body. Manually pull out the pinion until it reaches the pinion stop.

If the pinion retracts immediately when it is released, it is working properly.

NOTE: Do not leave the battery connected for more than 10 seconds.



(cont'd)

Starting System

Performance Test (cont'd)

Pinion Gap Check (Hitachi):

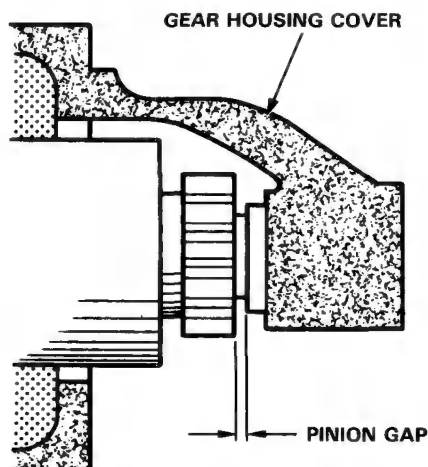
1. Disconnect the wire from terminal **M**.
2. When the battery is connected between terminals **S** and **M**, the pinion protrudes and stops. Keep the pinion in this position and measure the gap between the pinion and the stop.

NOTE: Do not leave the battery connected for more than 10 seconds.

Specification:

Pinion Gap: 0.3—2.5 mm (0.01—0.10 in)

3. If the pinion gap is out of the specified range, adjust the gap by increasing or decreasing the number of washers between the solenoid and the gear housing. When the number of washers is increased, the gap becomes smaller.



Starter No-Load Test:

1. Clamp the starter firmly in a vise.
2. Connect the starter to the battery as described in the diagram below and confirm that the motor starts and keeps rotating.
3. If the electric current and motor speed meet the specifications when the battery voltage is at 11 V, it is working properly.

Specifications:

Mitsuba: 80 A or less (Electric current),
(1.4 KW) 2600 rpm or more (Motor speed)

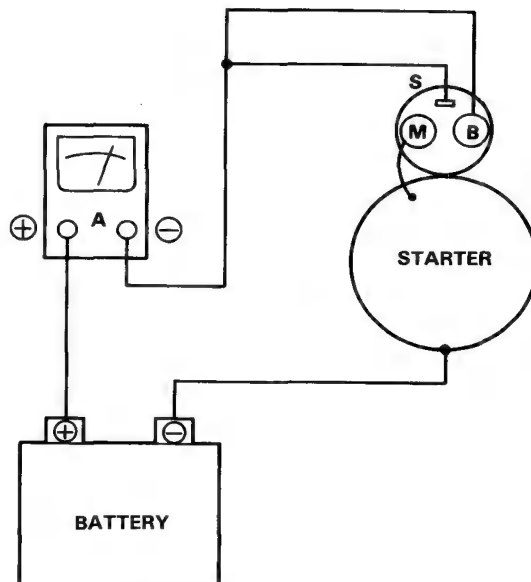
Mitsuba: 100 A or less (Electric current),
(1.2 KW) 3000 rpm or more (Motor speed)

Mitsuba: 100 A or less (Electric current),
(1.0 KW) 3000 rpm or more (Motor-speed)

Nippondenso: 90 A or less (Electric current),
(1.2 KW) 3000 rpm or more (Motor-speed)

Nippondenso: 90 A or less (Electric current),
(1.0 KW) 3000 rpm or more (Motor-speed)

Hitachi: 60 A or less (Electric current),
(0.8 KW) 6000 rpm or more (Motor-speed)



Ignition System



Component Location Index

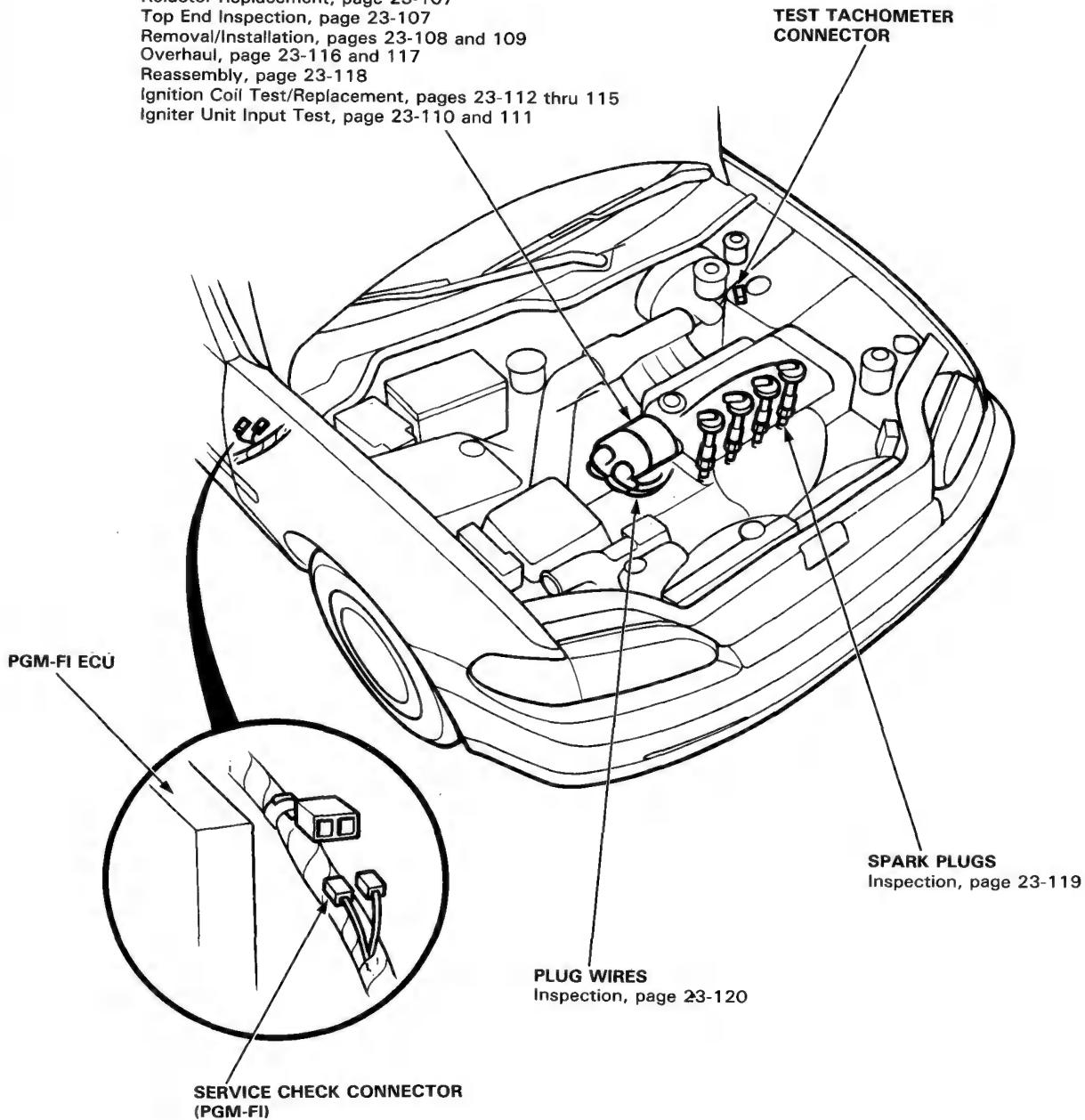
IGNITION TIMING CONTROL SYSTEM

- Troubleshooting, section 11
- Inspection and setting, page 23-100 thru 105

NOTE: The illustration shows LHD type; RHD type is symmetrical.

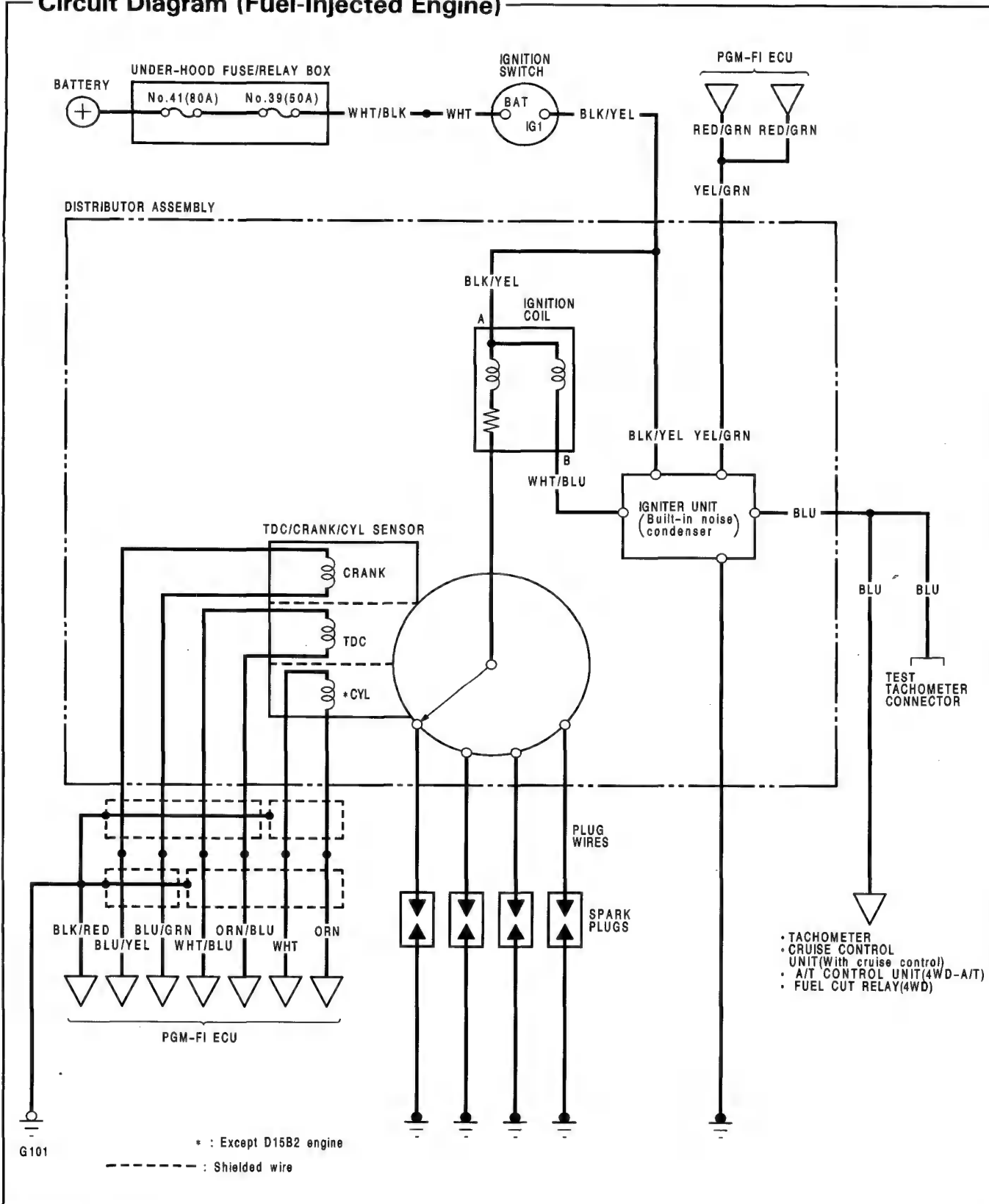
DISTRIBUTOR

- Advance Diaphragm Inspection, page 23-106
- Reluctor Replacement, page 23-107
- Top End Inspection, page 23-107
- Removal/Installation, pages 23-108 and 109
- Overhaul, page 23-116 and 117
- Reassembly, page 23-118
- Ignition Coil Test/Replacement, pages 23-112 thru 115
- Igniter Unit Input Test, page 23-110 and 111



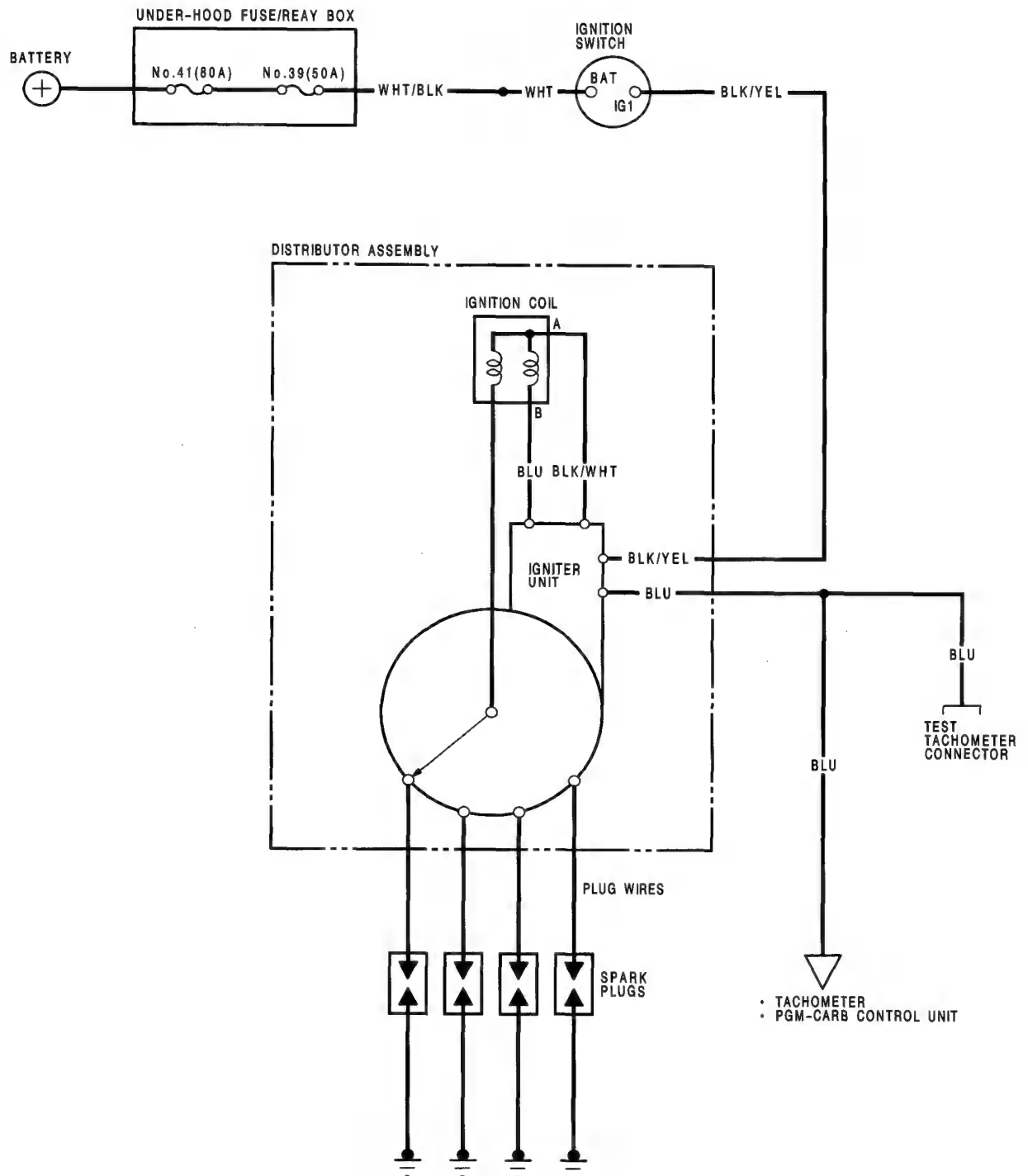
Ignition System

Circuit Diagram (Fuel-Injected Engine)





Circuit Diagram (Carbureted Engine)

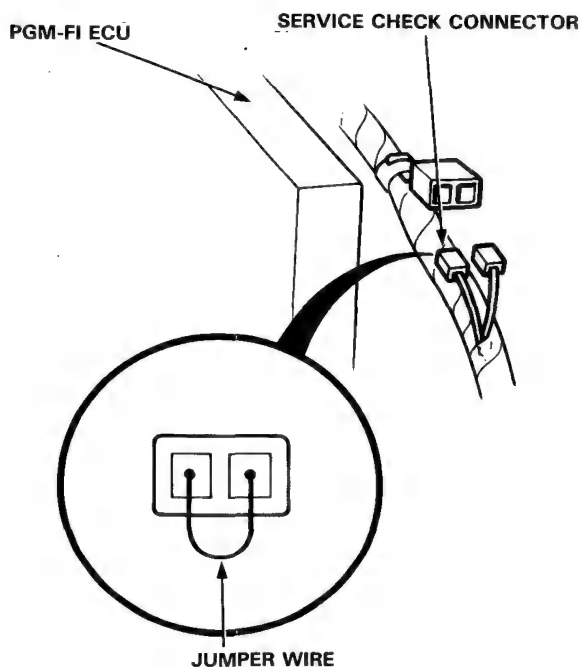


Ignition System

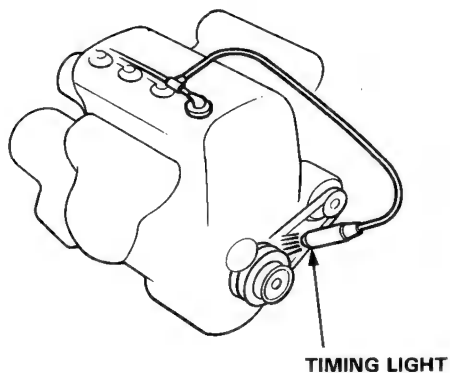
Ignition Timing Inspection and Setting (Fuel-Injected Engine)

1. Start the engine and allow it to warm up (cooling fan comes on).
2. Pull out the service check connector located behind the right kick panel. Connect the WHT/GRN and BRN terminals with a jumper wire.

NOTE: The illustration shows LHD type; RHD type is symmetrical.



3. Connect a timing light to the #1 plug wire and point it toward the pointer on the timing belt cover.





4. Adjust ignition timing, if necessary, to the following specifications:

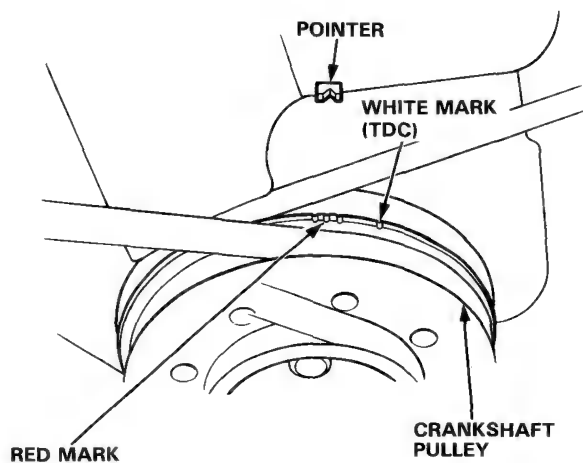
Ignition Timing:

D15B2/D16A7/D16Z/B16A2 engine
16° BTDC (RED) at 750 rpm

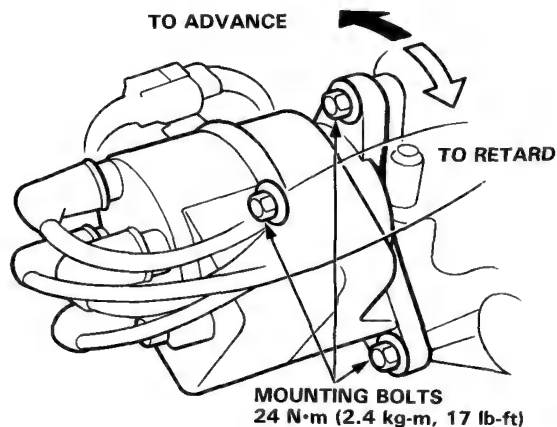
D15Z1 engine
16° BTDC (RED) at 600 rpm

D16A8/D16A9 engine
16° BTDC (RED) at 700 rpm

NOTE: Shift lever (M/T) or select lever (A/T) in neutral position.



5. If it is necessary to adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.



6. Tighten the adjusting bolts and recheck the timing.
7. Remove the jumper wire from the service check connector.

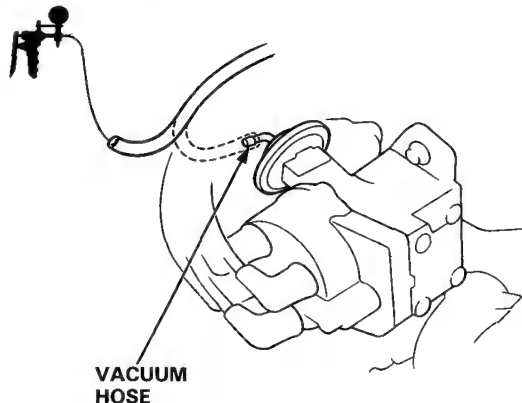
Ignition System

Ignition Timing Inspection and Setting (Cabureted Engine)

<Single Vacuum Control Type>

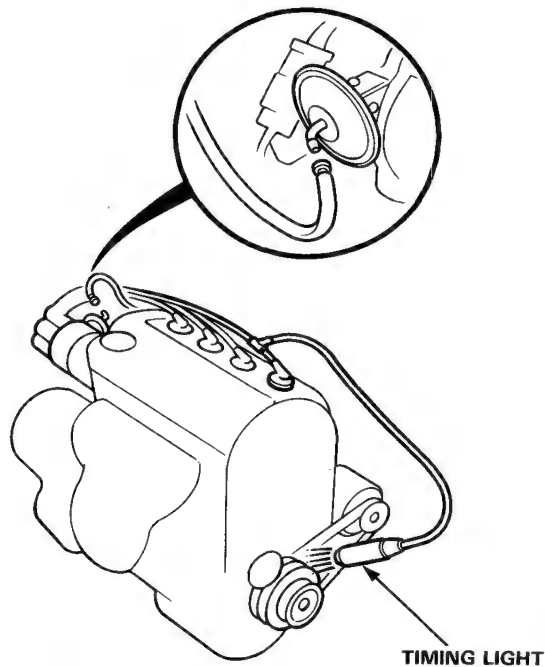
1. Disconnect the vacuum hose from the vacuum advance diaphragm, then connect the vacuum pump/gauge to the vacuum hose.

VACUUM
PUMP/GAUGE



2. Start the engine.
3. Check the vacuum hose for vacuum. There should be vacuum.
 - If there is no vacuum, check the vacuum hose for proper connection, cracks or blockage.
4. Connect the vacuum hose to the vacuum advance diaphragm and allow the engine to warm up (cooling fan comes on).
5. Disconnect the vacuum hose from the vacuum advance diaphragm and plug it.

6. Connect a timing light to the #1 plug wire and point it toward the pointer on the timing belt cover.



7. Adjust ignition timing, if necessary, to the following specifications:

Initial Timing:

D12B1 engine

M/T: 0° TDC (WHT) at 800 rpm

A/T: 0° TDC (WHT) at 1000 rpm

D13B3 engine

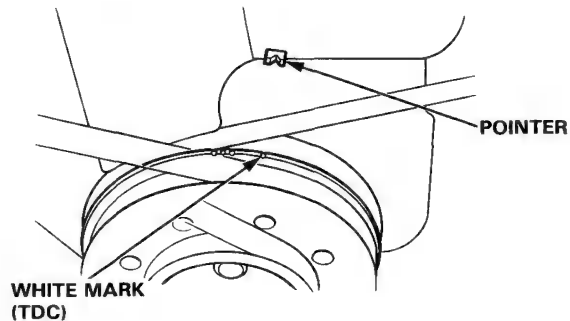
M/T: 2° BTDC (WHT) at 800 rpm

D15B3 engine

M/T: 2° BTDC (WHT) at 800 rpm

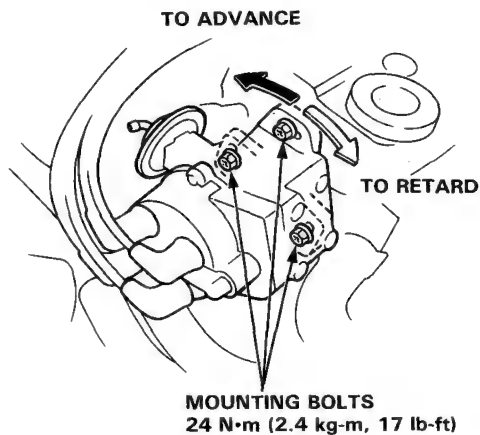
A/T: 2° BTDC (WHT) at 1000 rpm

NOTE: Shift lever (M/T) or select lever (A/T) in neutral position.





8. If it is necessary to adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.



9. Tighten the adjusting bolts and recheck the timing.

10. Connect the vacuum hose to the vacuum advance diaphragm and inspect ignition timing at idle.

Ignition Timing:

D12B1 engine

M/T: 16° BTDC (RED) at 800 rpm

A/T: 22° BTDC (RED) at 1000 rpm

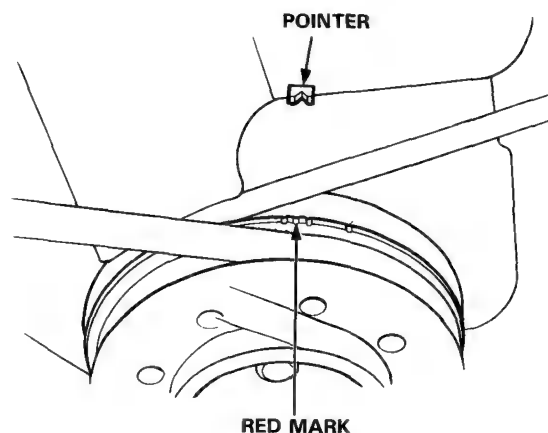
D13B3 engine

M/T: 20° BTDC (RED) at 800 rpm

D15B3 engine

M/T: 20° BTDC (RED) at 800 rpm

A/T: 12° BTDC (RED) at 1000 rpm



If advance is not as specified, check the vacuum advance diaphragm and distributor advance mechanism.

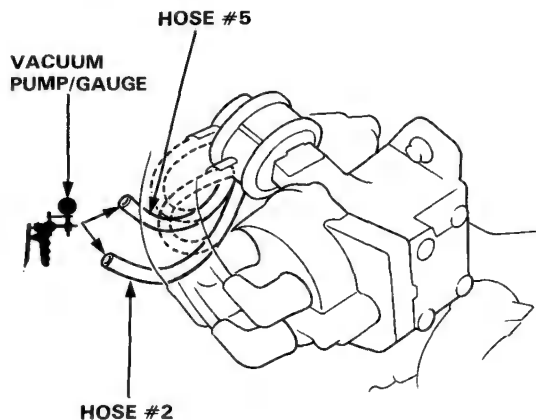
(cont'd)

Ignition System

Ignition Timing Inspection and Setting (Cabureted Engine) (cont'd)

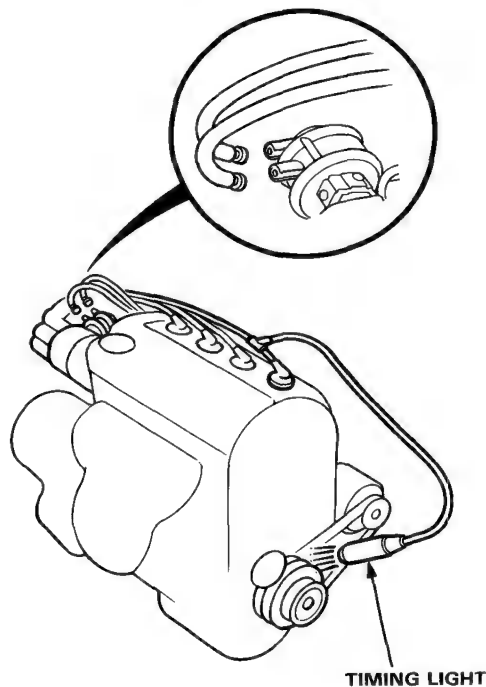
<Dual Vacuum Control Type>

1. Disconnect the vacuum hoses from the vacuum advance diaphragm, then connect the vacuum pump/gauges to the vacuum hoses.



2. Start the engine and let it idle.
3. When the engine is cool, coolant temperature is below 55°C (131°F). Check each hose for vacuum. The #2 and #5 hoses should have vacuum.
 - If the #2 hose has no vacuum, check it for proper connection, cracks or blockage.
 - If the #5 hose has no vacuum, check the #5 and connected hoses for proper connections, cracks or blockage, and check that the check valve is not clogged. If the #5 and connected hoses, and the check valve have no problem, recheck the #5 hose for vacuum.

4. Connect the vacuum hoses to the vacuum advance diaphragm and allow the engine to warm up (cooling fan comes on).
5. Disconnect the #5 hose from the vacuum advance diaphragm and connect the vacuum pump/gauge to the #5 hose.
6. Check the #5 hose for vacuum. There should be no vacuum.
7. Disconnect the vacuum hoses from the vacuum advance diaphragm and plug them.
8. Connect a timing light to the #1 plug wire and point it toward the pointer on the timing belt cover.





9. Adjust ignition timing, if necessary, to the following specifications:

Initial Timing:

D13B2 engine

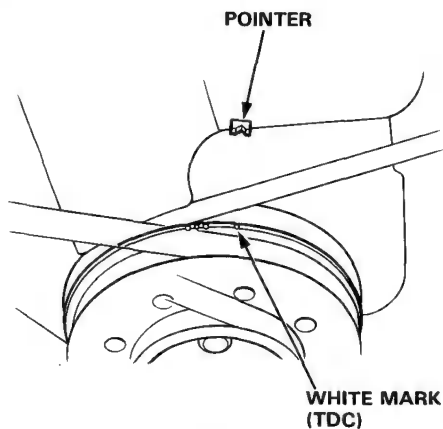
M/T: 2° BTDC (WHT) at 800 rpm

D15B4 engine

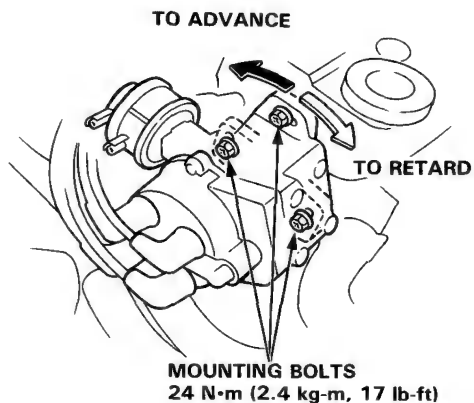
M/T: 2° BTDC (WHT) at 650 rpm

A/T: 2° BTDC (WHT) at 720 rpm

NOTE: Shift lever (M/T) or select lever (A/T) in neutral position.



10. If it is necessary to adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.



11. Tighten the adjusting bolts and recheck the timing.

12. Connect the vacuum hoses to the vacuum advance diaphragm and inspect ignition timing at idle.

Ignition Timing:

D13B2 engine

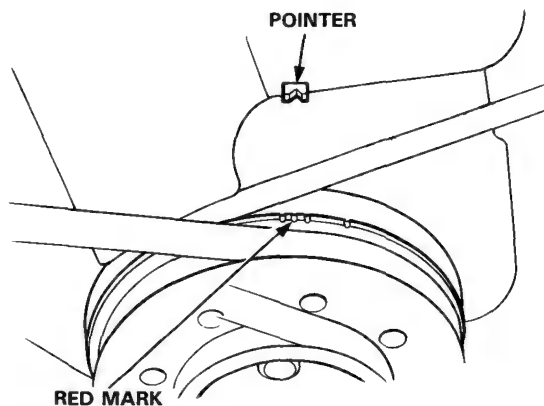
M/T: 20° BTDC (RED) at 800 rpm

D15B4 engine

M/T: 20° BTDC (RED) at 650 rpm

A/T: 20° BTDC (RED) at 720 rpm

NOTE: Shift lever (M/T) or select lever (A/T) in neutral position.

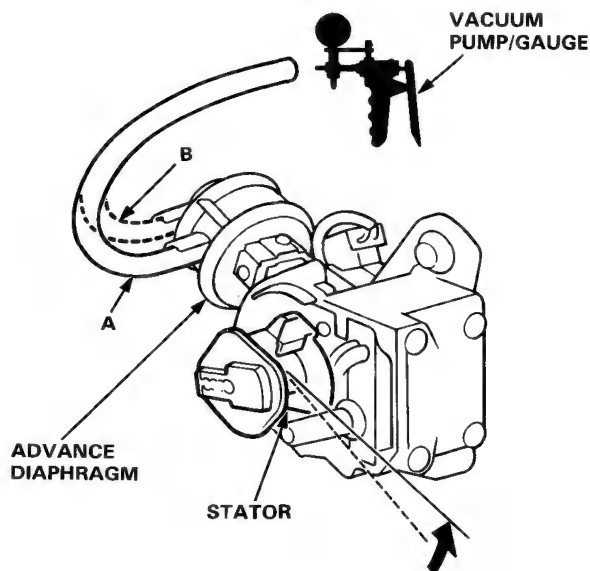


If advance is not as specified, check the vacuum advance diaphragm and distributor advance mechanism.

Ignition System

Advance Diaphragm Inspection

1. Remove the distributor cap and vacuum hoses from the advance diaphragm.
2. Connect a vacuum pump/gauge to the advance diaphragm A (inside port).



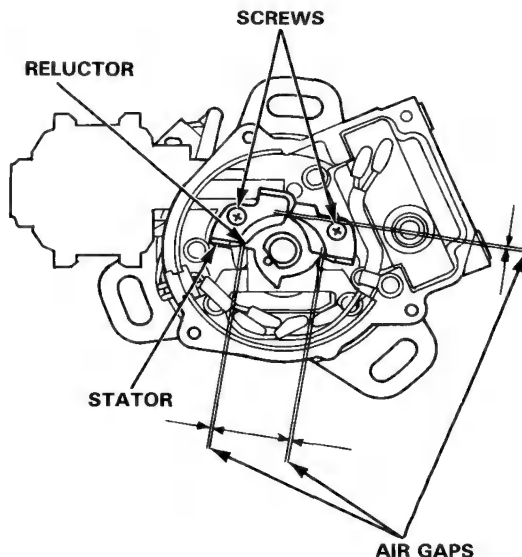
3. When vacuum (more than 400 mm Hg) is applied to the diaphragm, the stator should turn counter-clockwise and stay. If the stator does not turn or stay, replace the diaphragm.

When vacuum is released, the stator should return. If the stator does not return, repair or replace as necessary.

4. Repeat steps 2 and 3 for the advance diaphragm B (outside port).

Air Gaps Test (Carbureted Engine)

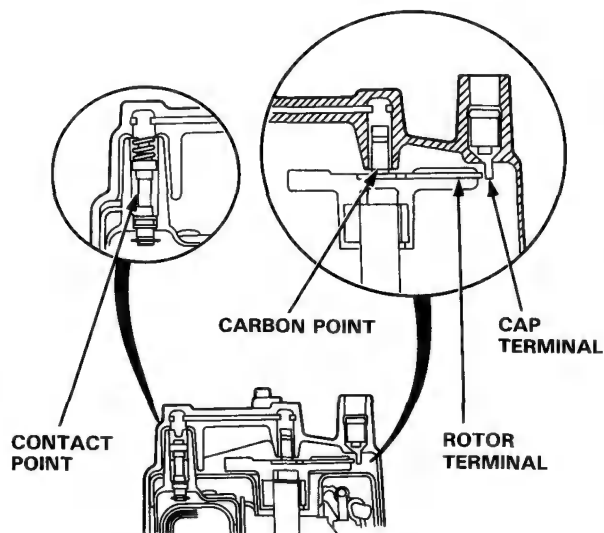
1. Check to be sure that the air gaps are equal.
2. If necessary, back off the screws and move the stator as required to adjust.





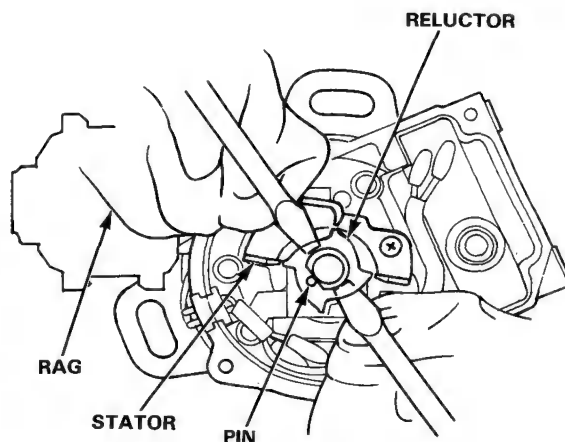
Distributor Top End Inspection

1. Check for rough or pitted rotor and cap terminals.
2. Scrape or file off the carbon deposits. If rough, smooth the rotor terminal with an oil stone or #600 sandpaper.
3. Check the distributor cap for cracks, wear and damage. If necessary, clean or replace it.



Reluctor Replacement (Carbureted Engine)

1. Carefully pry up the reluctor by using two screwdrivers as shown. Do not damage the reluctor and stator.



2. When installing the reluctor, be sure to drive in the pin with its gap away from the shaft.

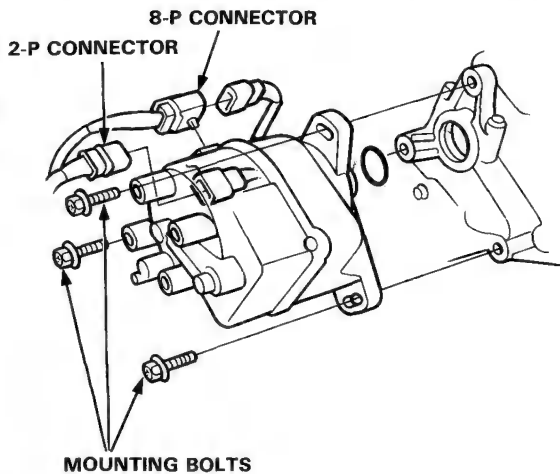
NOTE: The number or letter manufacturing code on the reluctor must always face up.

Ignition System

Distributor Removal/Installation (Fuel-Injected Engine)

Removal:

1. Disconnect the 2-P and 8-P connectors from the distributor.
2. Disconnect the plug wires from the distributor cap.

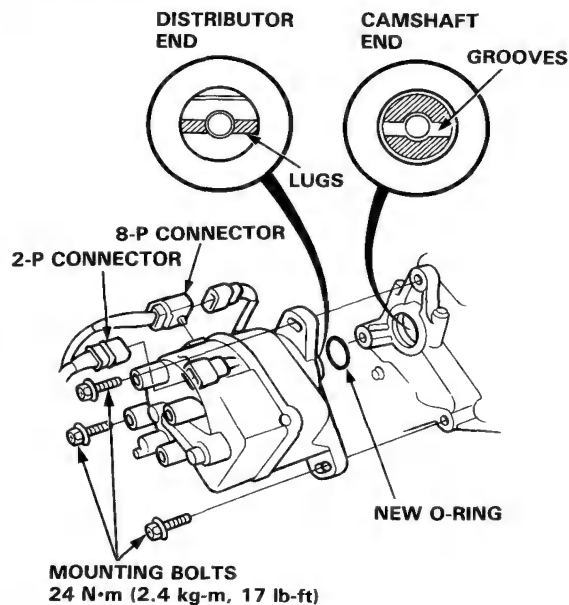


3. Remove the distributor mounting bolts, then remove the distributor from the cylinder head.

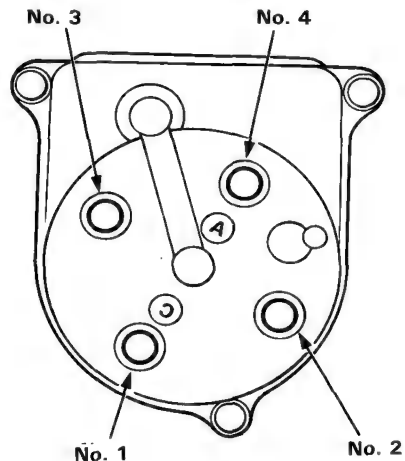
Installation:

1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

NOTE: The lugs on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.



3. Install the mounting bolts and tighten them temporarily.
4. Connect the 2-P and 8-P connectors to the distributor.
5. Connect the plug wires as shown.



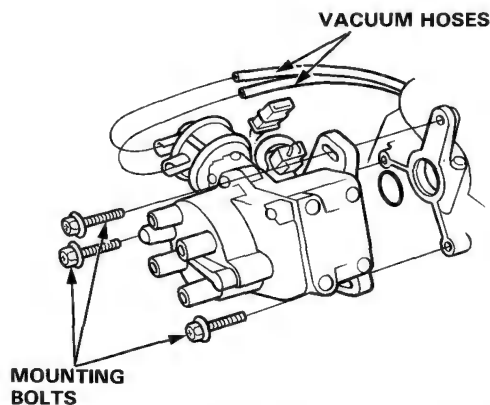
6. Set the timing with a timing light (see page 23-100).
7. After setting the timing, tighten the mounting bolts.



Distributor Removal/Installation (Carbureted Engine)

Removal:

1. Disconnect the 2-P connector from the distributor.
2. Disconnect the plug wires from the distributor cap.
3. Disconnect the vacuum hoses from the advance diaphragm.

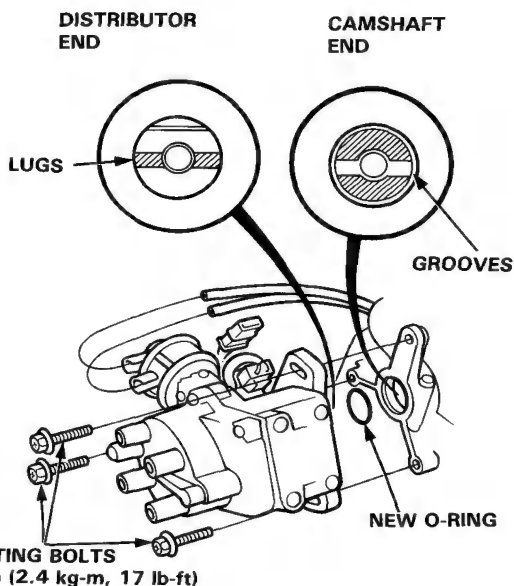


4. Remove the distributor mounting bolts, then remove the distributor from the cylinder head.

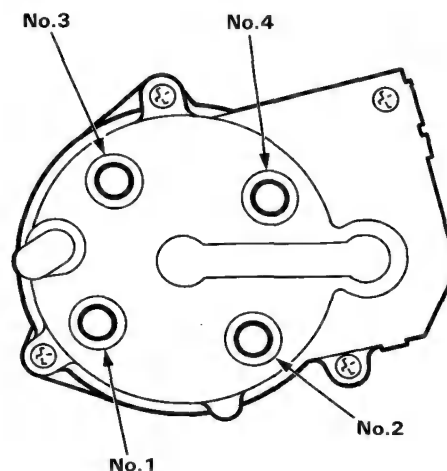
Installation:

1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

NOTE: The lugs on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.



3. Install the mounting bolts and tighten them temporarily.
4. Connect the 2-P and 8-P connectors to the distributor.
5. Connect the plug wires as shown.



6. Set the timing with a timing light (see page 23-102).
7. After setting the timing, tighten the mounting bolts.

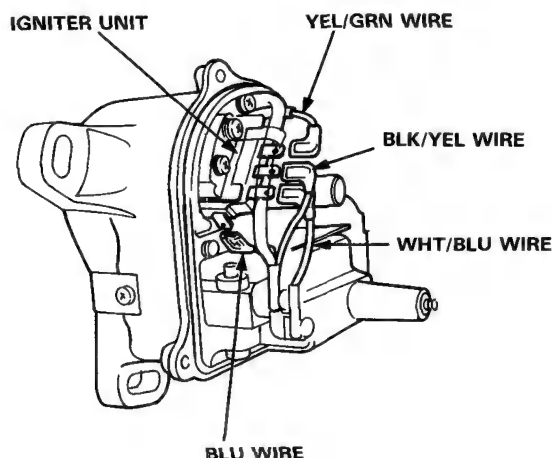
Ignition System

Igniter Unit Input Test (Fuel-Injected Engine)

NOTE:

- See section 11 when the self-diagnostic indicator blinks.
- Perform an input test for the igniter unit after finishing the fundamental tests for the ignition system and the fuel and emissions systems.
- The tachometer should operate normally.

1. Remove the distributor cap, the rotor, and the inner cover.
2. Disconnect the BLK/YEL, WHT/BLU, YEL/GRN, and BLU wires from the igniter unit.



3. Turn the ignition switch ON. Check for voltage between the BLK/YEL wire and body ground. There should be battery voltage.
 - If there is no battery voltage, check the BLK/YEL wire between the ignition switch and the igniter unit.
 - If there is battery voltage, go to step 4.
4. Turn the ignition switch ON. Check for voltage between the WHT/BLU wire and body ground. There should be battery voltage.
 - If there is no battery voltage, check for:
 - Ignition coil.
 - WHT/BLU wire between the ignition coil and the igniter unit.
 - If there is battery voltage, go to step 5.

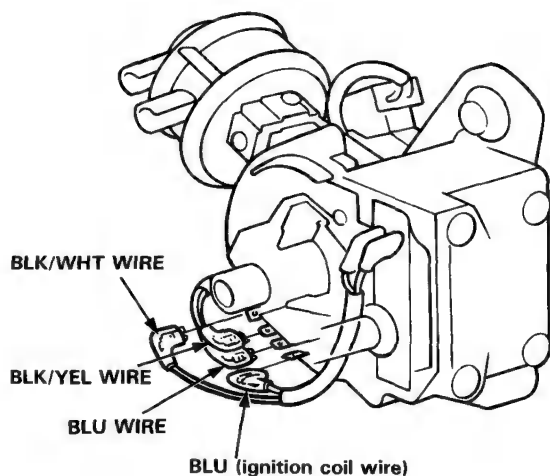
5. Check the YEL/GRN wire between the PGM-FI ECU and the igniter unit.
6. Check the BLU wire between the tachometer and the igniter unit.
7. If all tests are normal, replace the igniter unit.



Igniter Unit Input Test (Carbureted Engine)

NOTE: The tachometer should operate normally.

1. Remove the distributor cap and the rotor.
2. Disconnect the BLK/YEL, BLK/WHT, BLU, and BLU (ignition coil) wires from the igniter unit.



3. Turn the ignition switch ON. Check the voltage between the BLK/YEL wire and the body ground. There should be battery voltage.
 - If there is no battery voltage, check the BLK/YEL wire across the ignition switch and the igniter unit.
 - If there is battery voltage, go to step 4.
4. Check the BLK/WHT and the BLU wires between the ignition coil and the igniter unit.
5. Check the BLU wire between the tachometer and the igniter unit.
6. If all tests are normal, replace the igniter unit.

Ignition System

Ignition Coil Test (Fuel-Injected Engine)

1. With the ignition switch OFF, remove the distributor cap.
2. Remove the 2 screws to disconnect the BLK/YEL and WHT/BLU wires from the terminals A (+) and B (-) respectively.

3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.
NOTE: Resistance will vary with the coil temperature; specifications are at 20°C (68°F)

Primary Winding Resistance

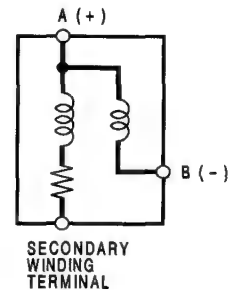
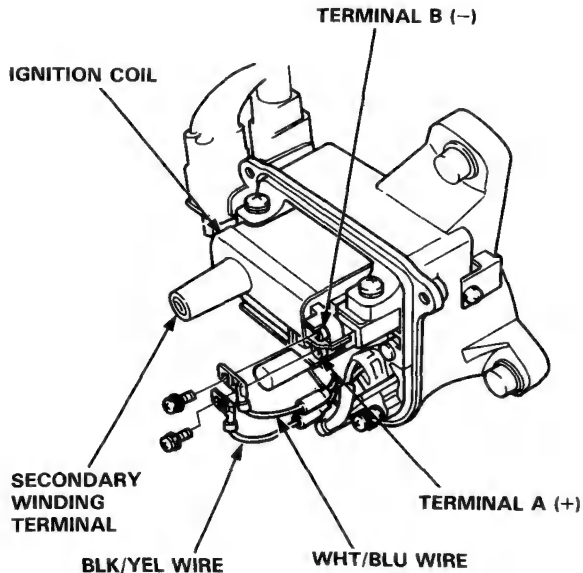
(between the A and B terminals):

0.6—0.8 ohms

Secondary Winding Resistance

(between the A and secondary winding terminals):

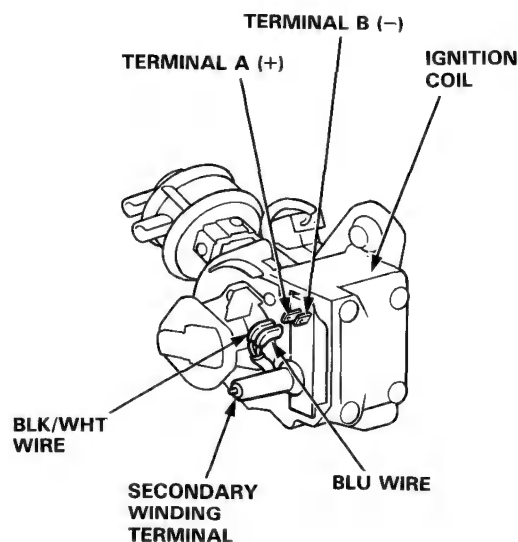
13,200—19,800 ohms





Ignition Coil Test (Carbureted Engine)

1. With the ignition switch OFF, remove the distributor cap.
2. Disconnect the BLK/WHT and BLU wires from the terminals A (+) and B (+) respectively.



3. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

NOTE: Resistance will vary with the coil temperature; specifications are at 20°C (68°F)

Primary Winding Resistance

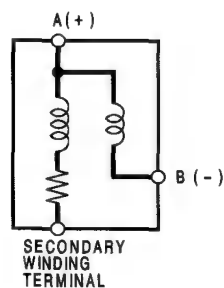
(between the A and B terminals):

0.5–0.7 ohms

Secondary Winding Resistance

(between the A and secondary winding terminals):

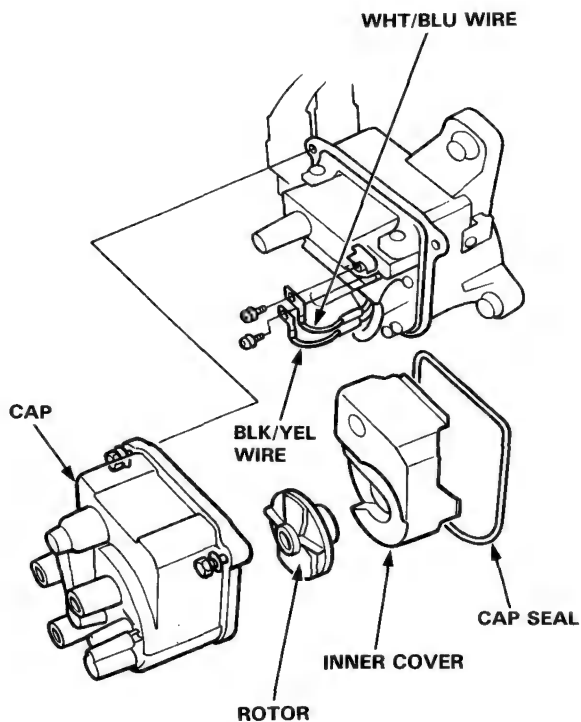
14,400–21,600 ohms



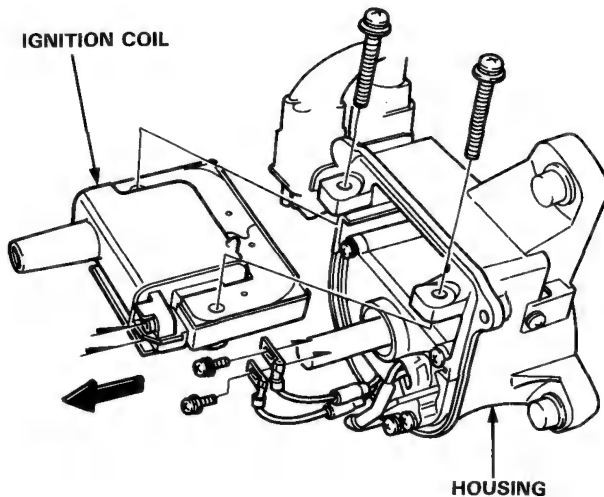
Ignition System

Ignition Coil Replacement (Fuel-Injected Engine)

1. With the ignition switch OFF, remove the distributor cap, rotor and cap seal, then remove the inner cover.
2. Remove the 2 screws to disconnect the BLK/YEL and WHT/BLU wires from the terminals.



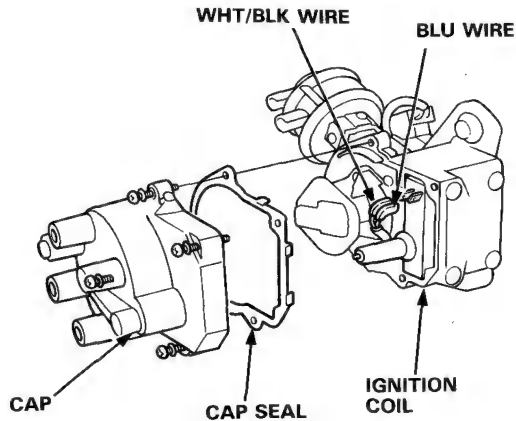
3. Remove the 2 screws and slide the ignition coil out of the distributor housing.





Ignition Coil Replacement (Carbureted Engine)

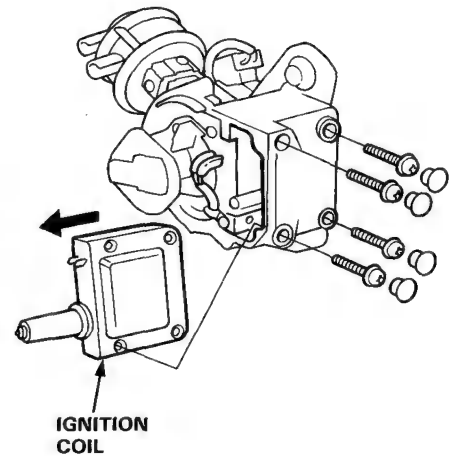
1. With the ignition switch OFF, remove the distributor cap and cap seal.
2. Disconnect the BLK/WHT and BLU wires from the terminal.



3. Remove the rubber caps from the distributor housing.
4. Remove the 4 screws and slide the ignition coil out of the distributor housing.

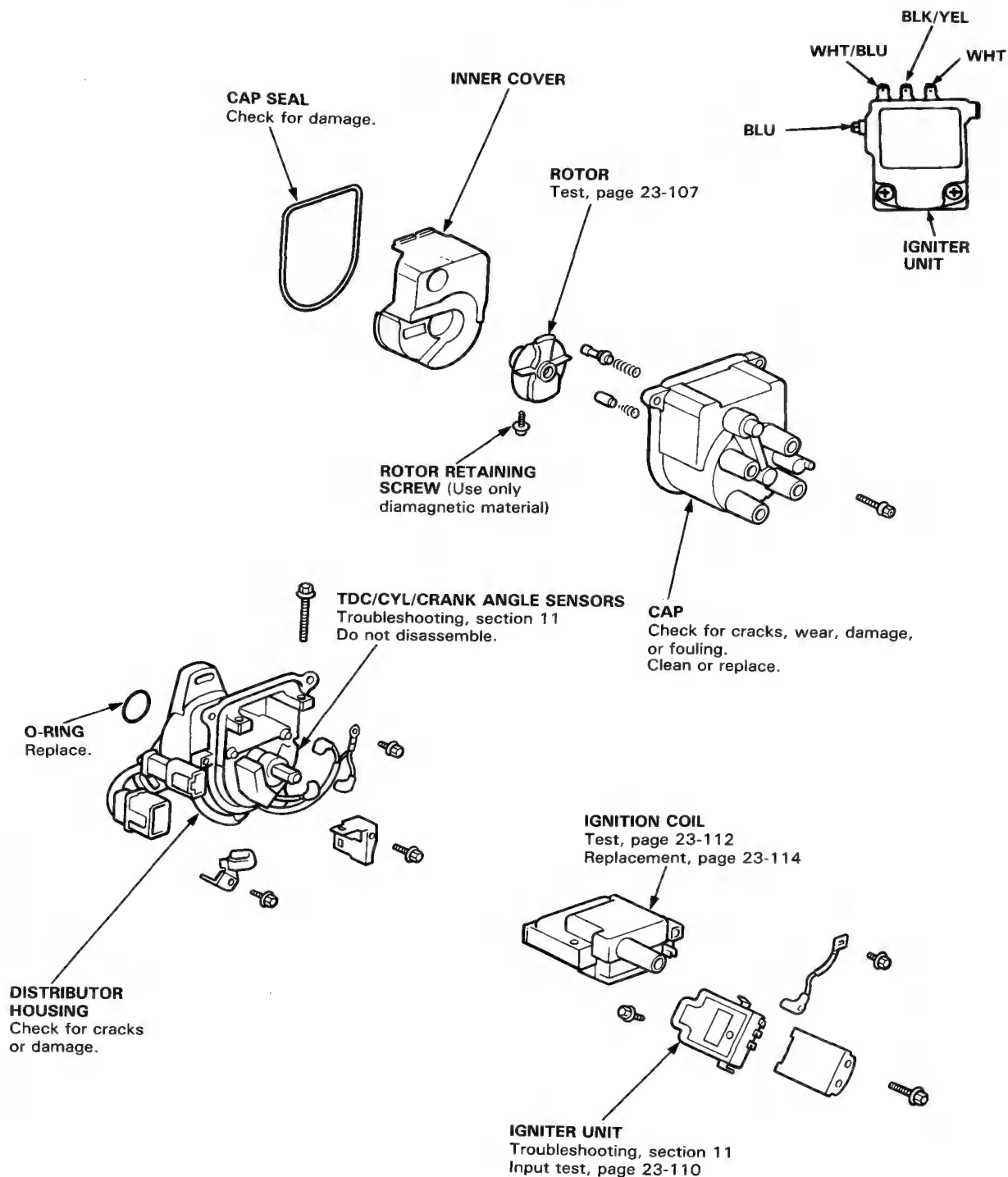
NOTE:

- Replace the rubber caps if they are worn out.
- Installing the rubber caps, apply silicon grease to them.
- Make sure that the wires are clamped and apart from a stator, etc.



Ignition System

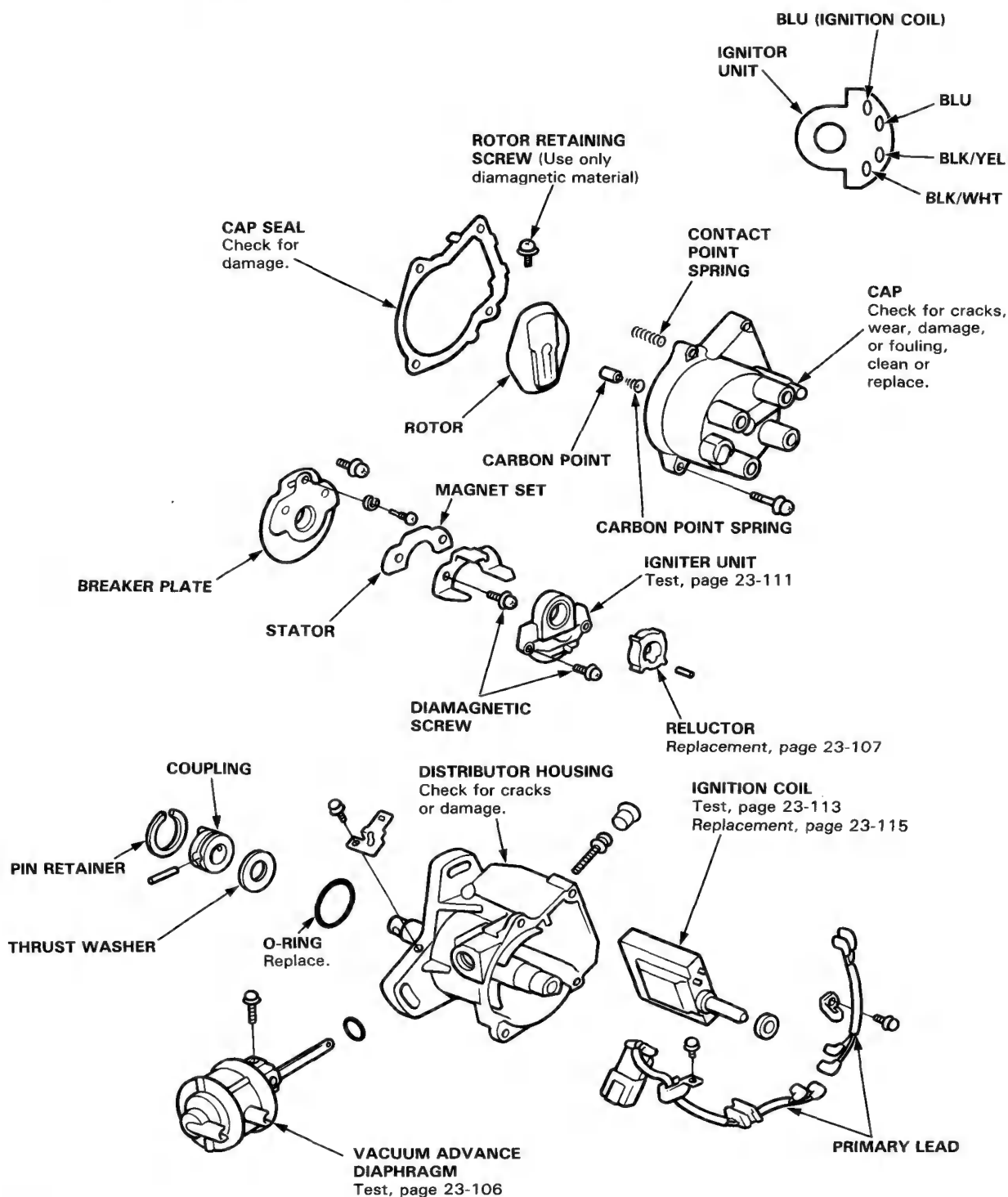
Distributor Overhaul (Fuel-Injected Engine)





Distributor Overhaul (Carbureted Engine)

NOTE: After installing the reluctor, adjust the air gaps between the stator and reluctor (see page 16-106).



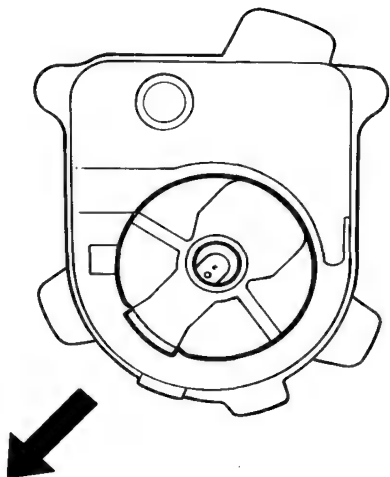
Ignition System

Distributor Reassembly

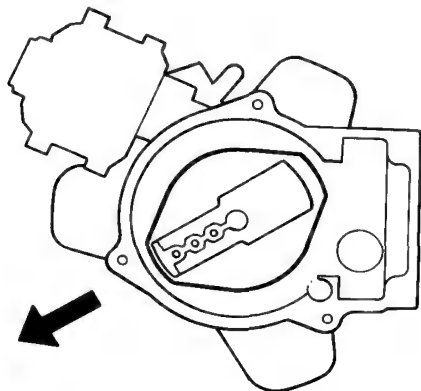
Reassemble the distributor shaft and housing in the reverse order of disassembly.

1. Install the rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).

Fuel-Injected Engine:

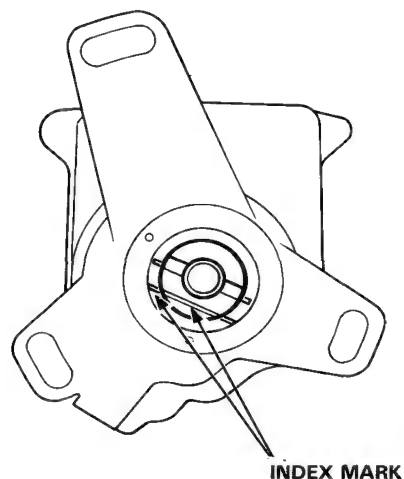


Carbureted Engine:

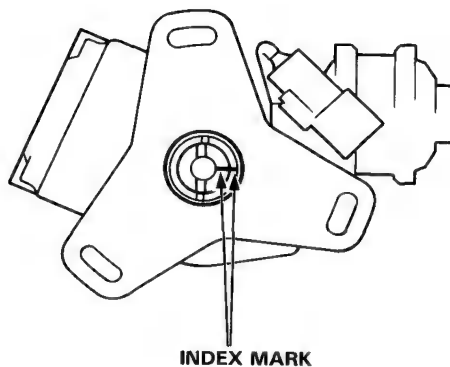


2. Slip the thrust washer and coupling onto the shaft.
3. Check that the rotor is still pointing toward the No. 1 cylinder, then align the index mark on the housing with the index mark on the coupling.

Fuel-Injected Engine:



Carbureted Engine:

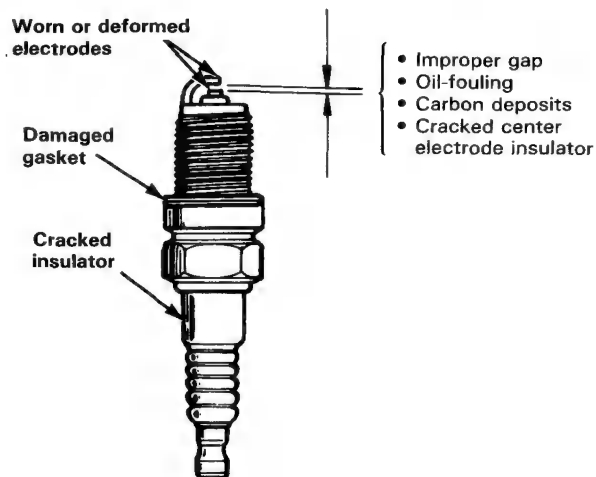


4. Drive in the pin and secure it with the pin retainer.



Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator for:



Burned or worn electrodes may be caused by:

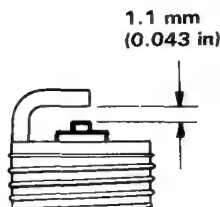
- Advanced ignition timing
- Loose spark plug
- Plug heat range too low
- Insufficient cooling

Fouled plug may be caused by:

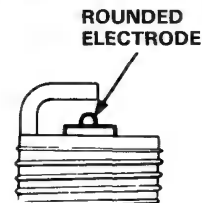
- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Plug heat range too high
- Excessive idling/low speed running
- Clogged air cleaner element
- Deteriorated ignition coil or ignition wires

2. Adjust the gap with a suitable gapping tool.

Electrode Gap: 1.1 mm (0.043 in)



3. Replace the plug if the center electrode is rounded as shown below:



NOTE: Do not use spark plugs other than those listed below, because these plugs are a new type (ISO standard).



These marks are sealed on the timing belt cover.

Spark Plug

D12B1/D13B3 engine

BKR5E-11 (NGK) K16PR-U11 (Nippondenso)	For all normal driving.
BKR6E-11 (NGK) K20PR-U11 (Nippondenso)	For hot climates or continuous high speed driving.

D13B2/D15B2/D15B3/D15B4/D16A7/D16Z engine

BKR6E-11 (NGK) K20PR-U11 (Nippondenso)	For all normal driving.
BKR7E-11 (NGK) K22PR-U11 (Nippondenso)	For hot climates or continuous high speed driving.

D15Z1 engine

ZFR5F-11 (NGK) KJ16CR-L11 (Nippondenso)	For all normal driving.
ZFR6F-11 (NGK) KJ20CR-L11 (Nippondenso)	For hot climates or continuous high speed driving.

D16A8/D16A9/B16A2 engine

BKR6E-N11 (NGK) K20PR-L11 (Nippondenso)	For all normal driving.
BKR7E-N11 (NGK) K22PR-L11 (Nippondenso)	For hot climates or continuous high speed driving.

4. Screw the plugs into the cylinder head finger tight, then torque them to 18 N·m (1.8 kg-m, 13 lb-ft).

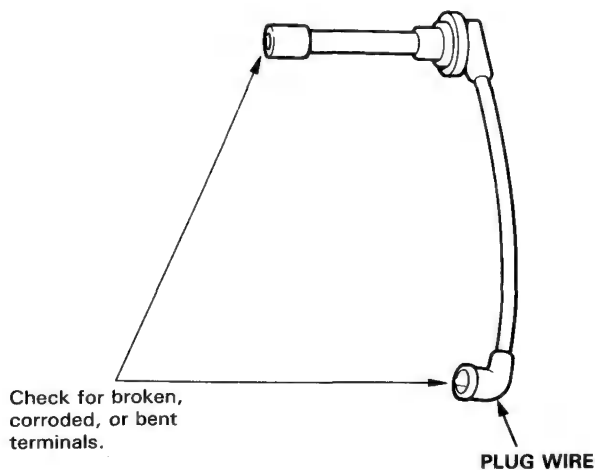
NOTE: Apply a small quantity of anti-seize compound to the plug threads before installing.

Ignition System

Ignition Wire Inspection and Test

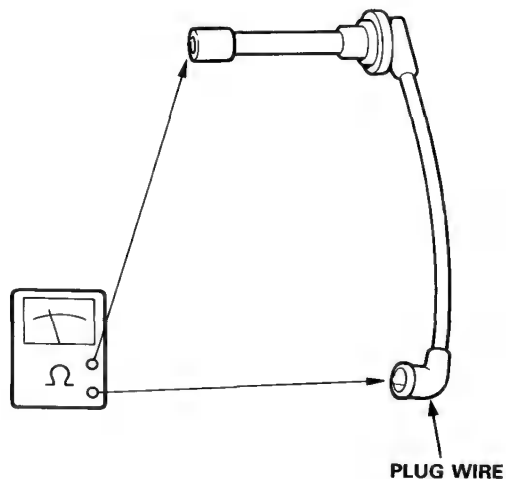
CAUTION: Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.

1. Check the condition of the wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the wire.



2. Connect ohmmeter probes and measure resistance.

Ignition Wire Resistance:
25,000 ohms max. at 20°C (70°F)



3. If resistance exceeds 25,000 ohms, replace the ignition wire.

Charging System

Component Location Index

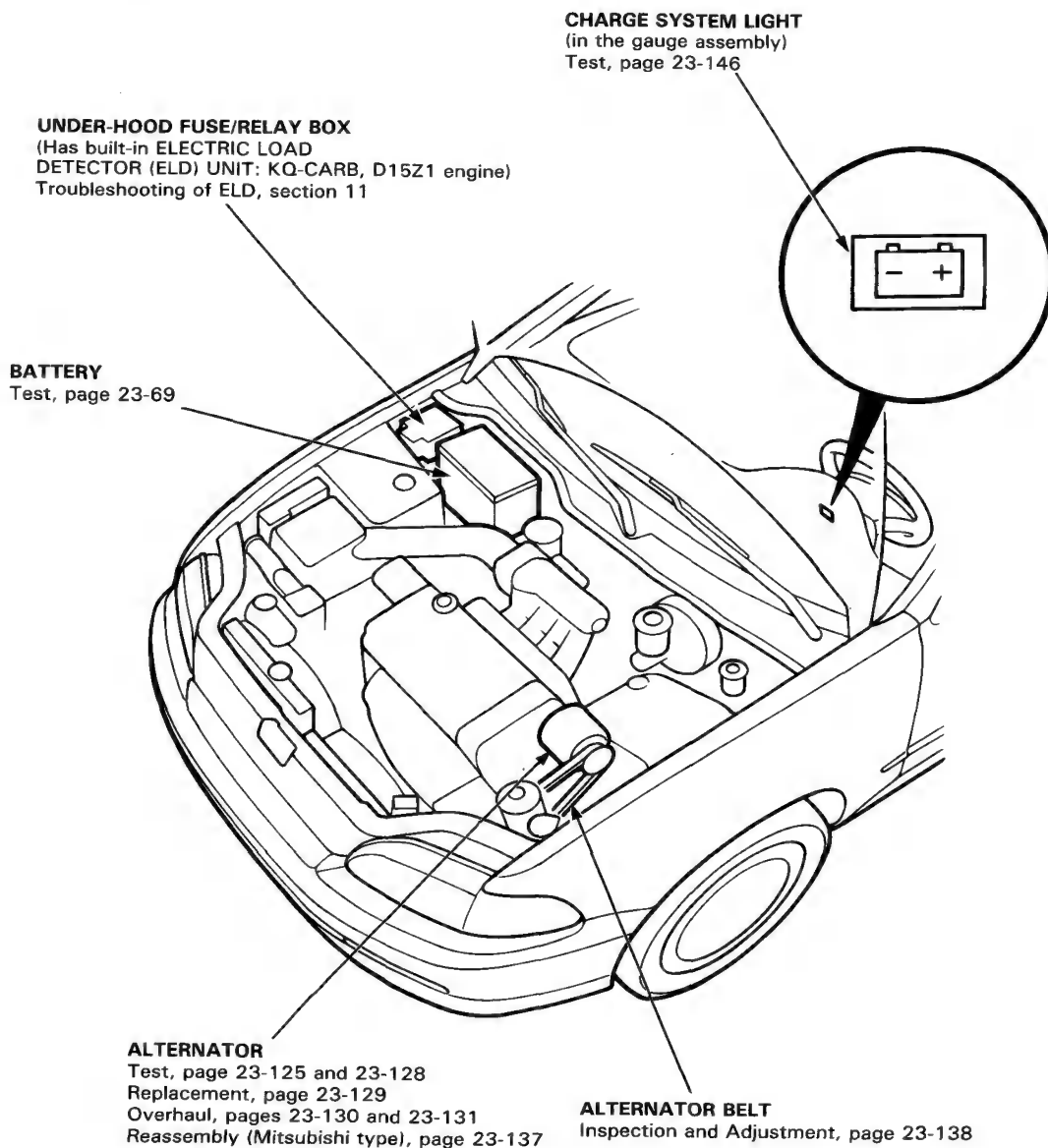


NOTE: RHD (PGM-FI) is symmetrical to the LHD type except of engine and alternator locations which remain the same.

● ALTERNATOR CONTROL SYSTEM

Description, page 23-122

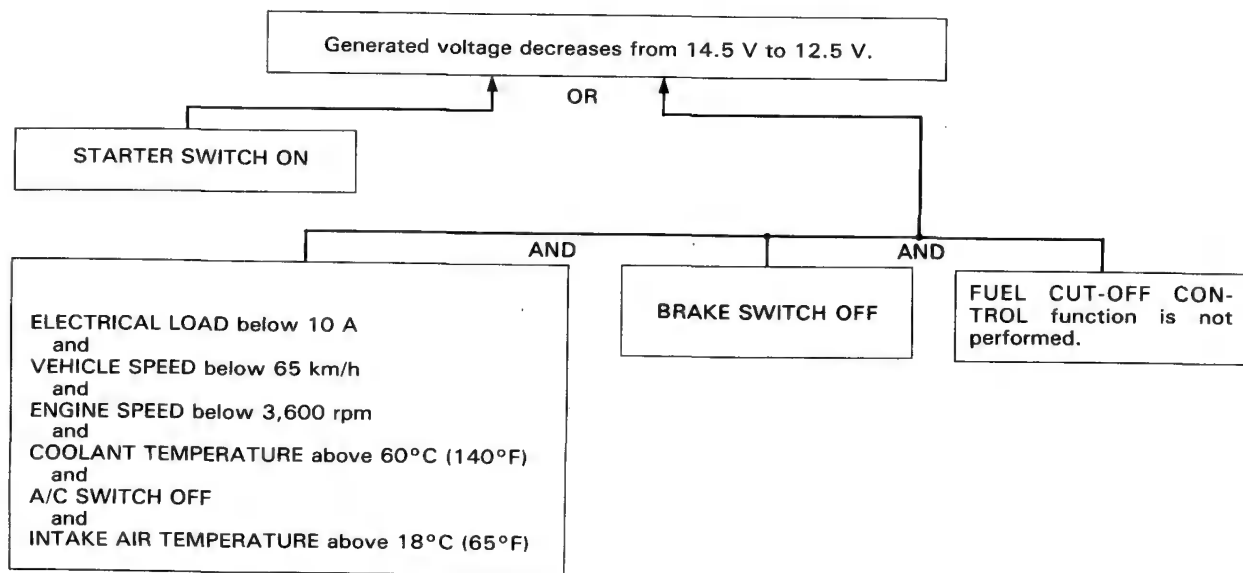
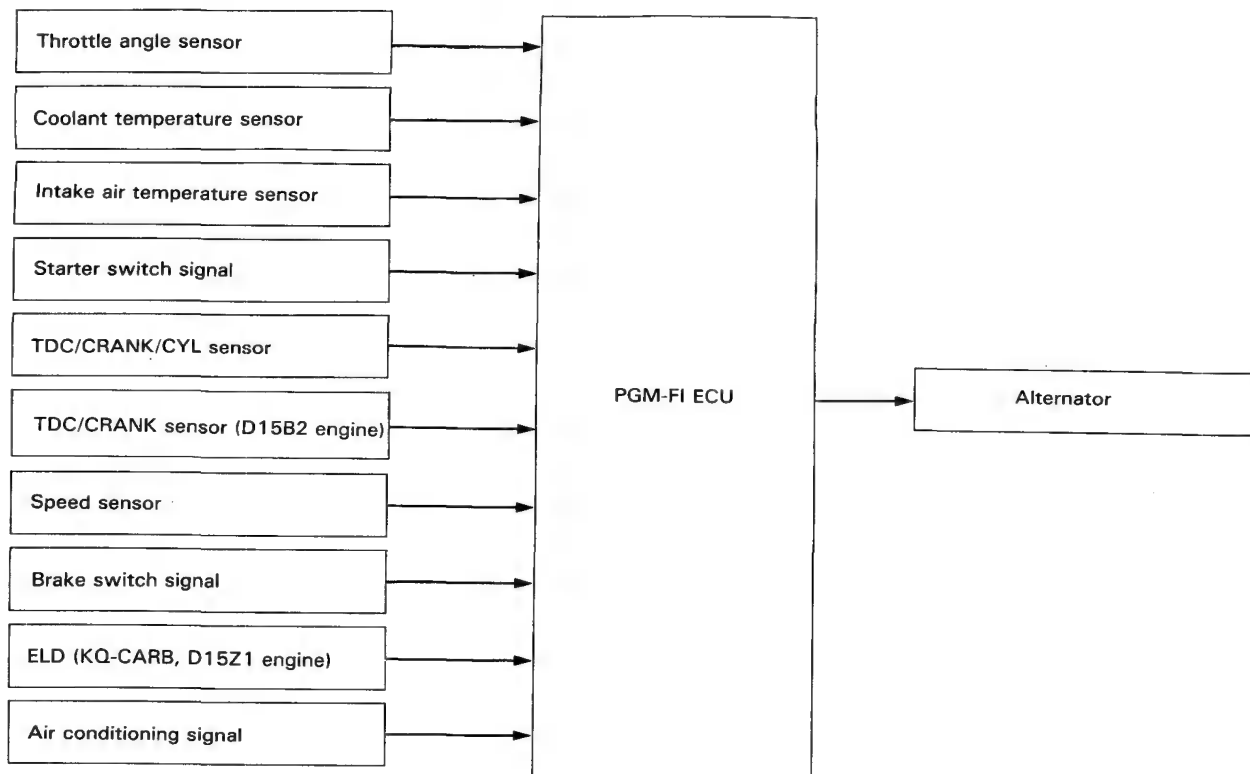
Troubleshooting, section 11



Charging System

Description

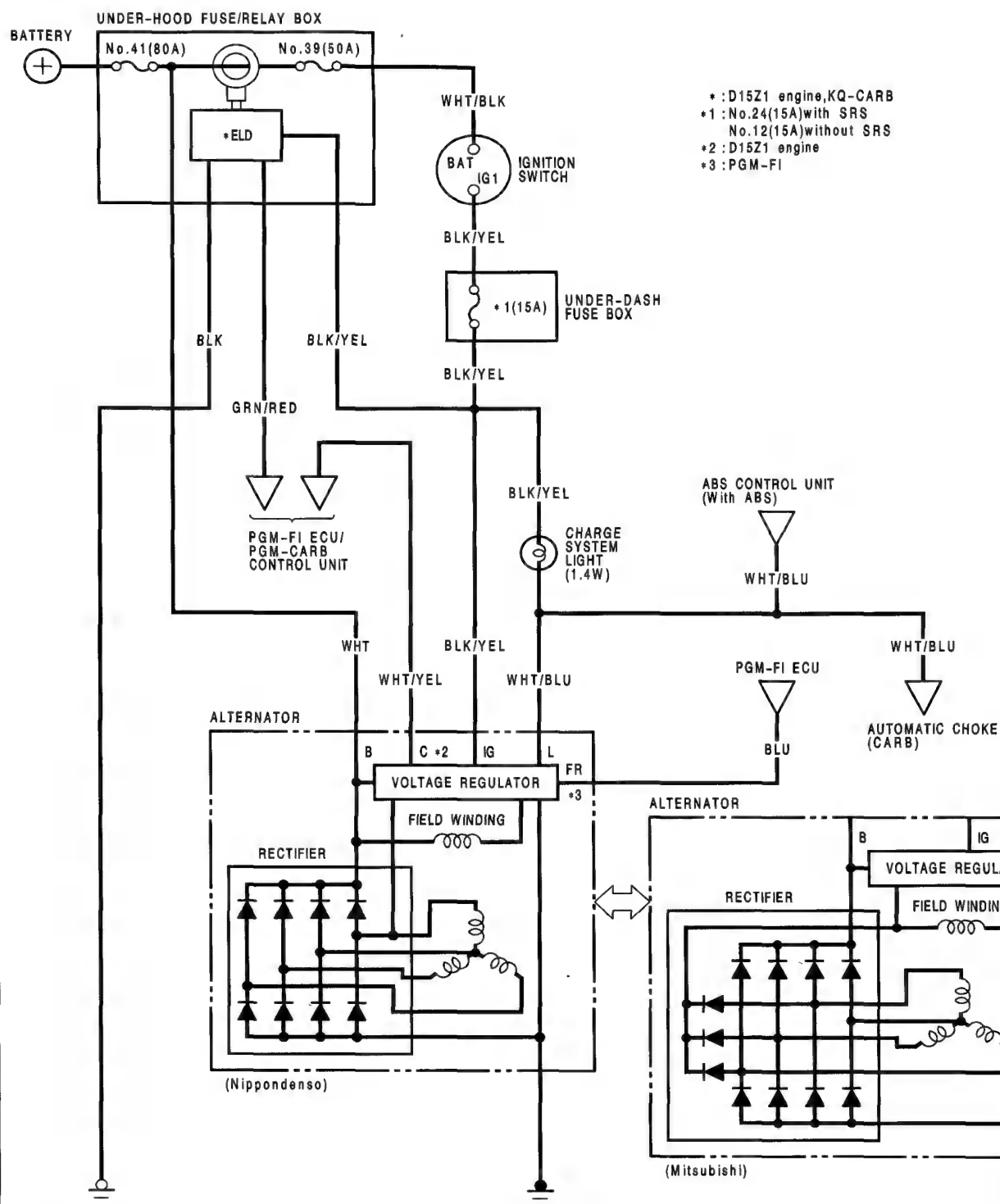
To improve fuel economy, the alternator control system within the PGM-FI ECU changes the voltage generated at the alternator in accordance with the driving conditions.





Charging System

Circuit Diagram



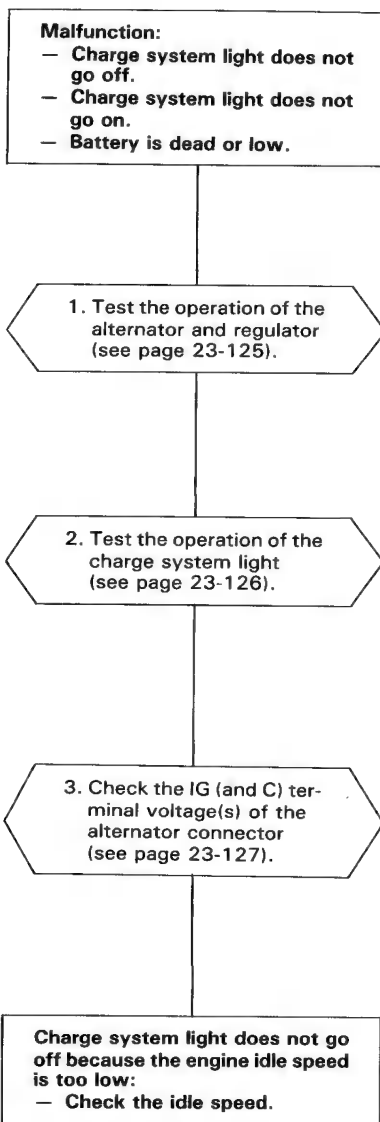
LHD : G201
G401
RHD : G301
G401

Charging System

Troubleshooting

NOTE:

- Before troubleshooting check:
 - Tightness of the alternator belt (see page 23-138).
 - That the self-diagnosis indicator light of the PGM-FI ECU does not blink. If it blinks (20 times), refer to section 11.
- Troubleshoot by performing following tests in the order listed below.



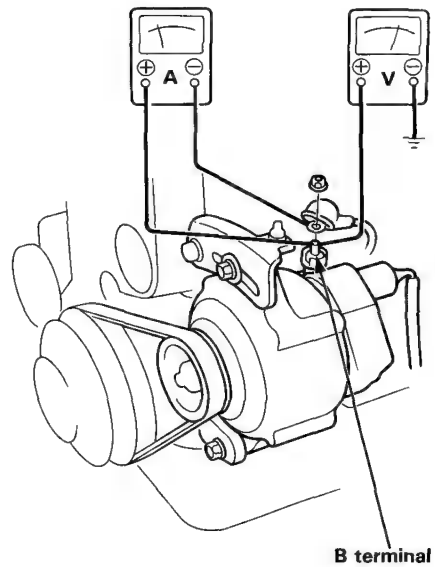


Alternator/Regulator Operation Test

CAUTION: Be careful during testing as the cooling fan comes on suddenly while the engine is running.

Be sure to use a good battery (see page 23-69). Disconnect the B terminal and connect an ammeter and a voltmeter as shown.

NOTE: Be sure to use an ammeter capable of measuring amperages higher than 120 A.



Start the engine and let it idle until it reaches normal operating temperature (cooling fan comes on 2 times).

Raise the engine speed to 2000 rpm and hold it there. Turn the headlights (HI) on and check the voltage at the battery terminals.

CAUTION: As the headlights warm up considerably, do not cover them.

Is the voltage between 13.9 and 15.1 V?

NO

Test the alternator (see page 23-128).

YES

Turn the blower motor and the rear window defogger on, and check the battery voltage.

Is the battery voltage less than 13.5 V?

NO

Turn also the fog lights, brake lights, etc. on)

YES

Read the amperage.

Are there more than 40 A?

NO

Test the alternator (see page 23-128).

YES

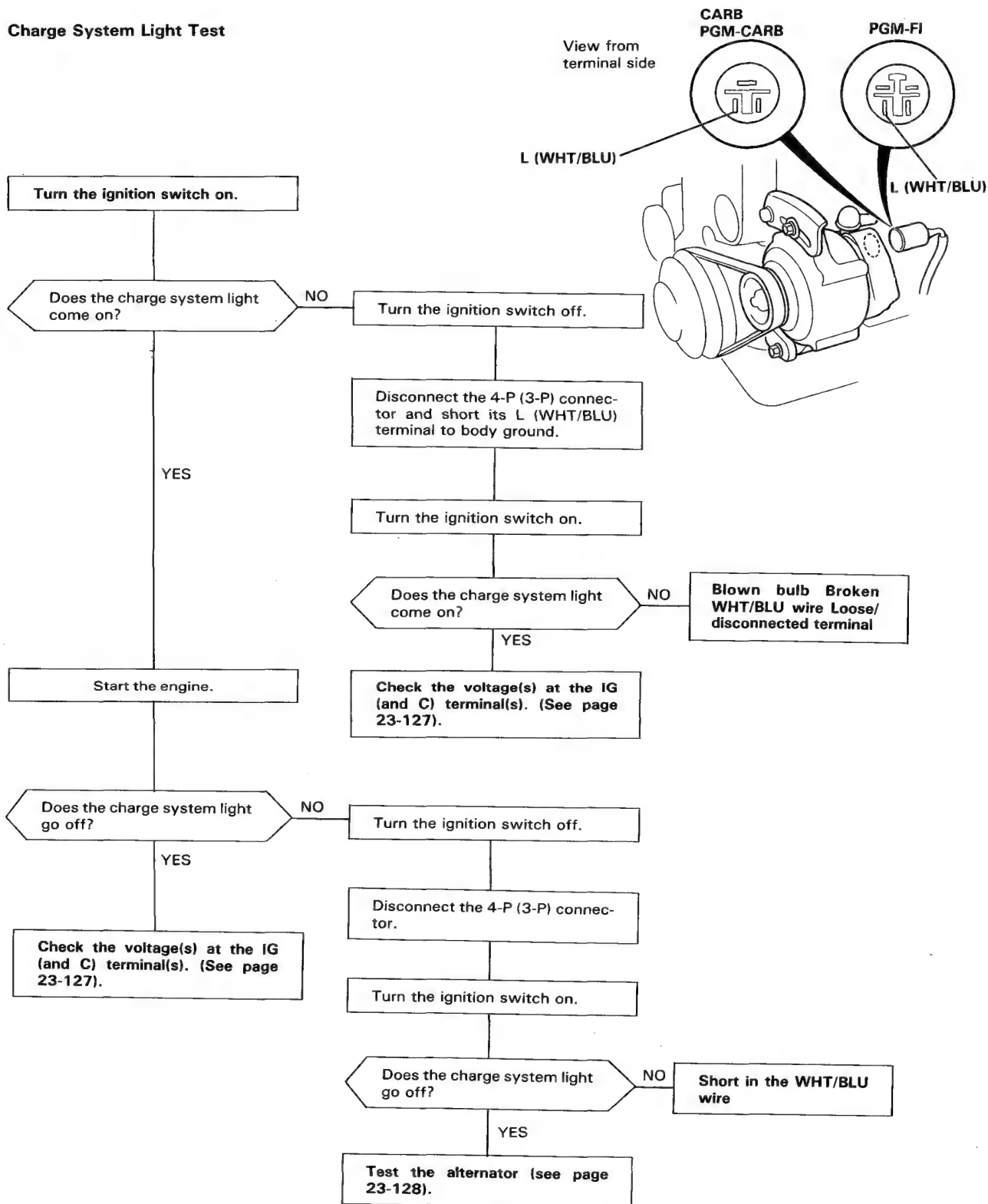
Alternator/Regulator operation is OK. Test the charge system light operation (see page 23-126).

(cont'd)

Charging System

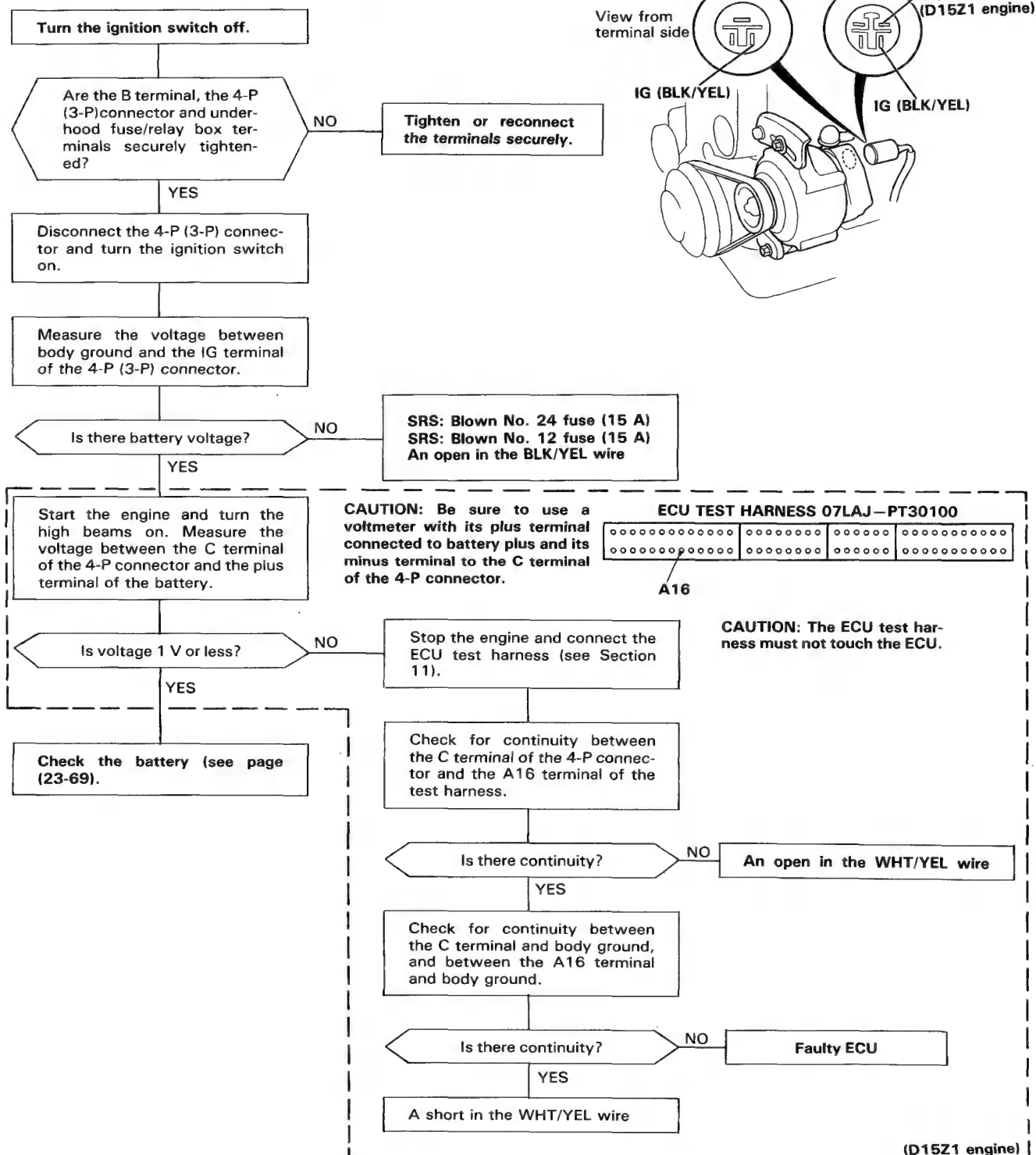
Troubleshooting (cont'd)

Charge System Light Test





Voltage Checks at IG and C (D15Z1 engine) terminals

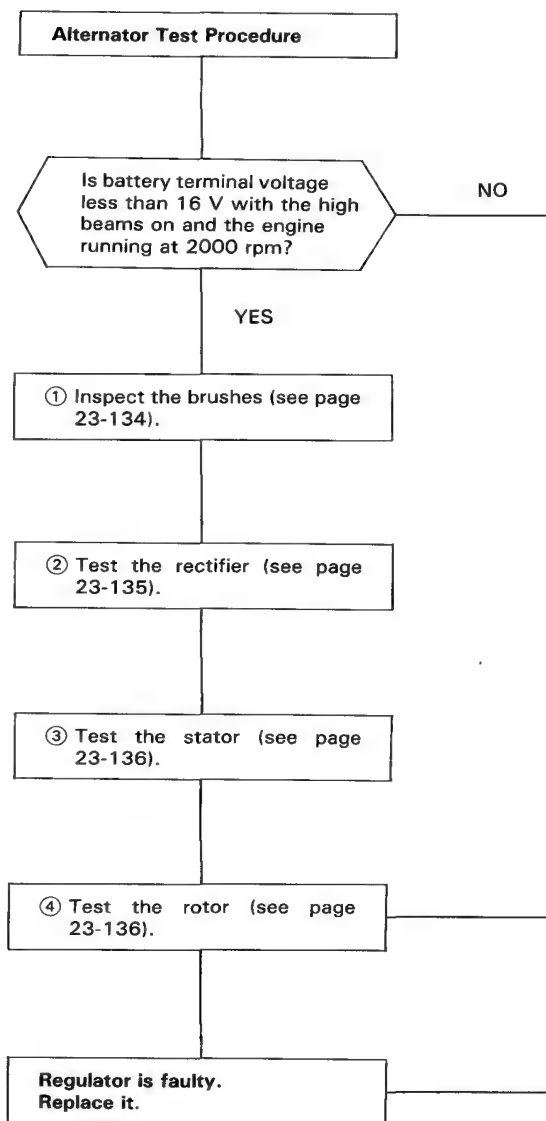


Charging System

Troubleshooting (cont'd)

Alternator Test

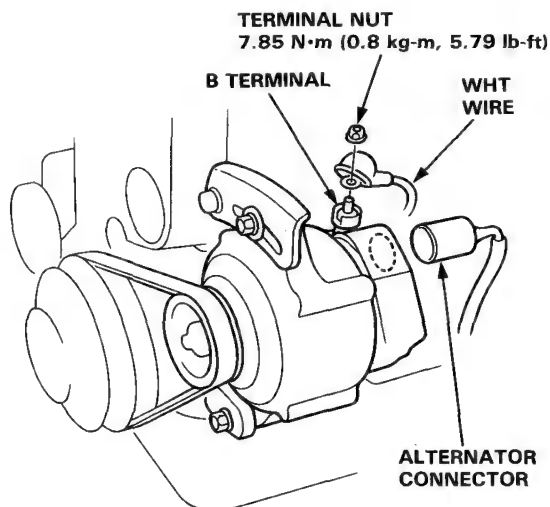
NOTE: Because an overall check is necessary to avoid misleading conclusions, test the alternator in the order described below.





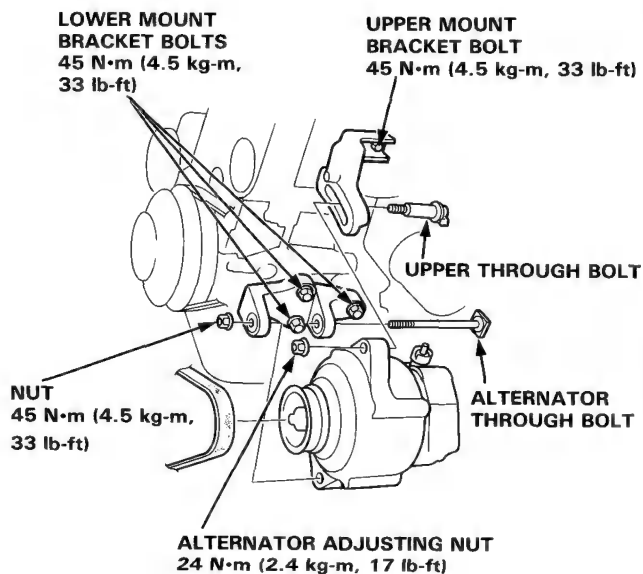
Alternator Replacement

1. Disconnect the cable from the battery negative (-) terminal.
2. Disconnect the alternator connector from the alternator.

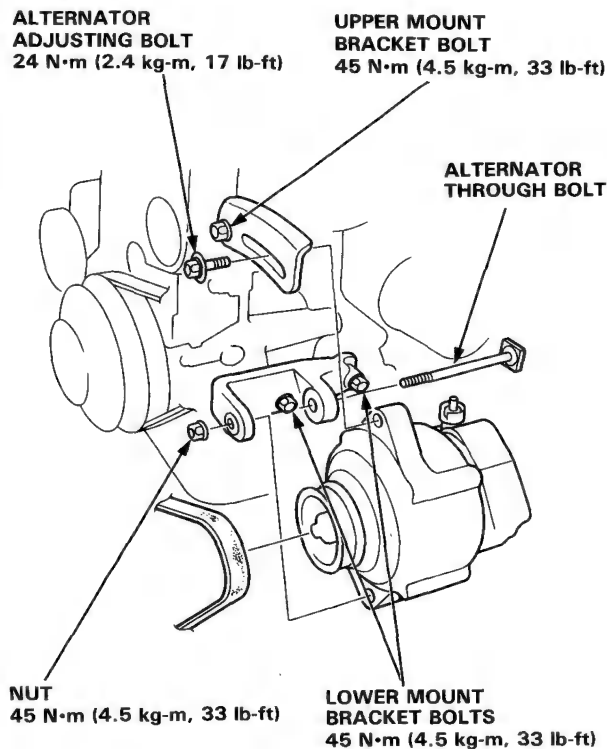


3. Remove the terminal nut and the WHT wire from the B terminal.

B16A2 engine:



4. Remove the adjusting bolt (B16A2 engine: adjusting nut) and through bolt nut, then remove the alternator belt from the pulley.
5. Pull out the alternator through bolt and the upper through bolt (B16A2 engine), then remove the alternator.



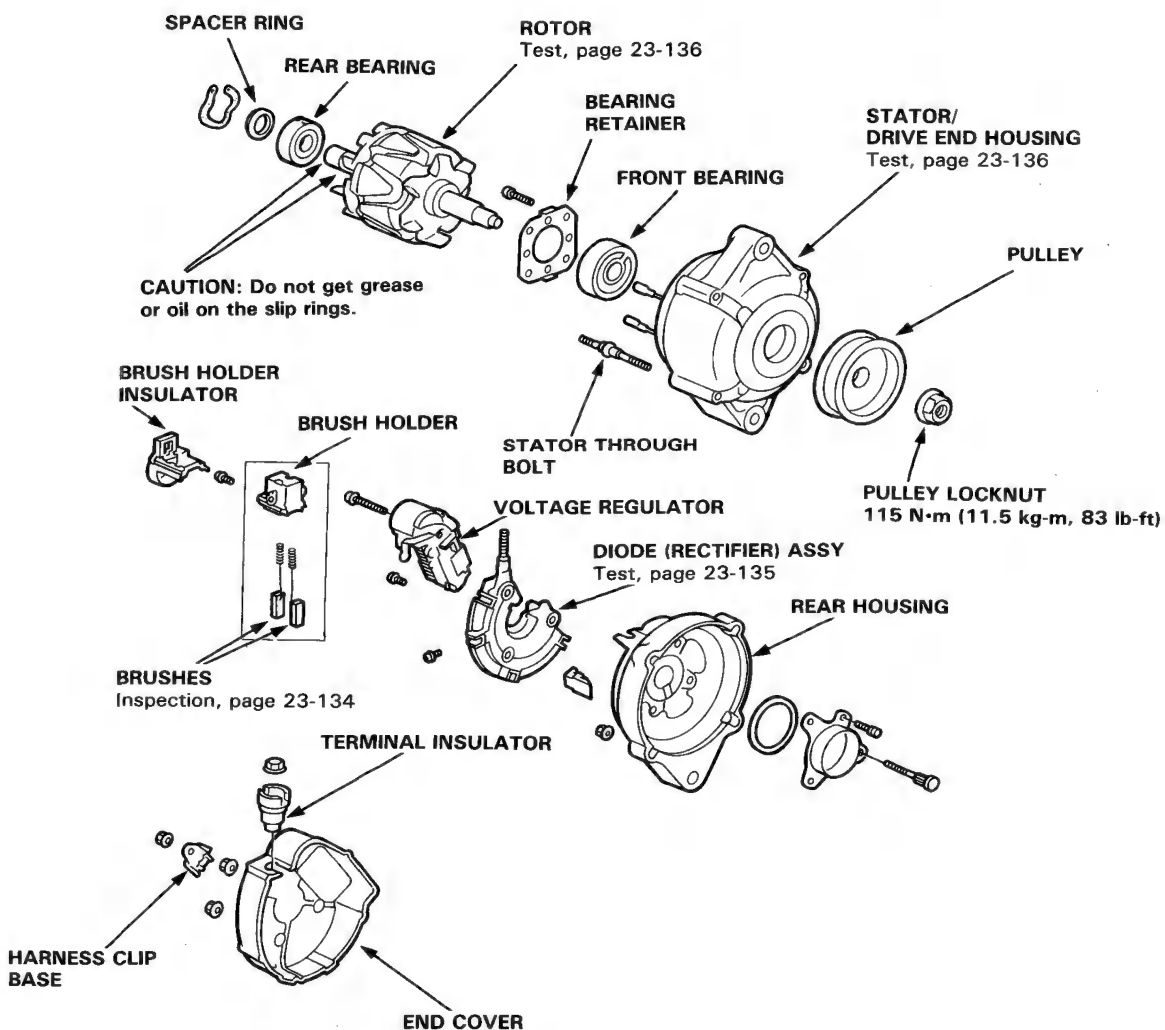
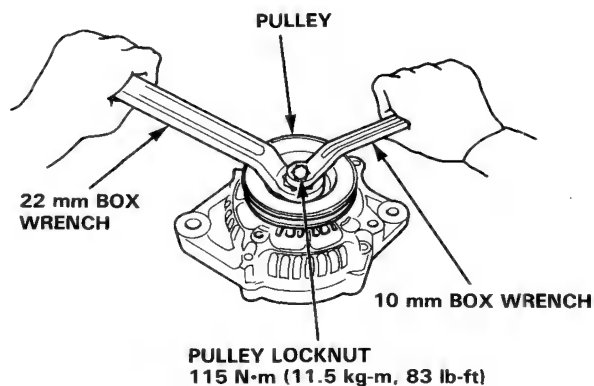
6. If necessary, remove the mount bracket bolts, and the upper and lower mount brackets.
7. Adjust the alternator belt tension after installation (see page 23-138).

Charging System

Alternator Overhaul (Nippondenso Type)

NOTE: Only if the front bearing needs replacement, is it necessary to separate the pulley, drive end housing, and the rotor.

To loosen the locknut for removing the pulley from the rotor, use 10 mm and 22 mm wrenches. If necessary, use an impact wrench.

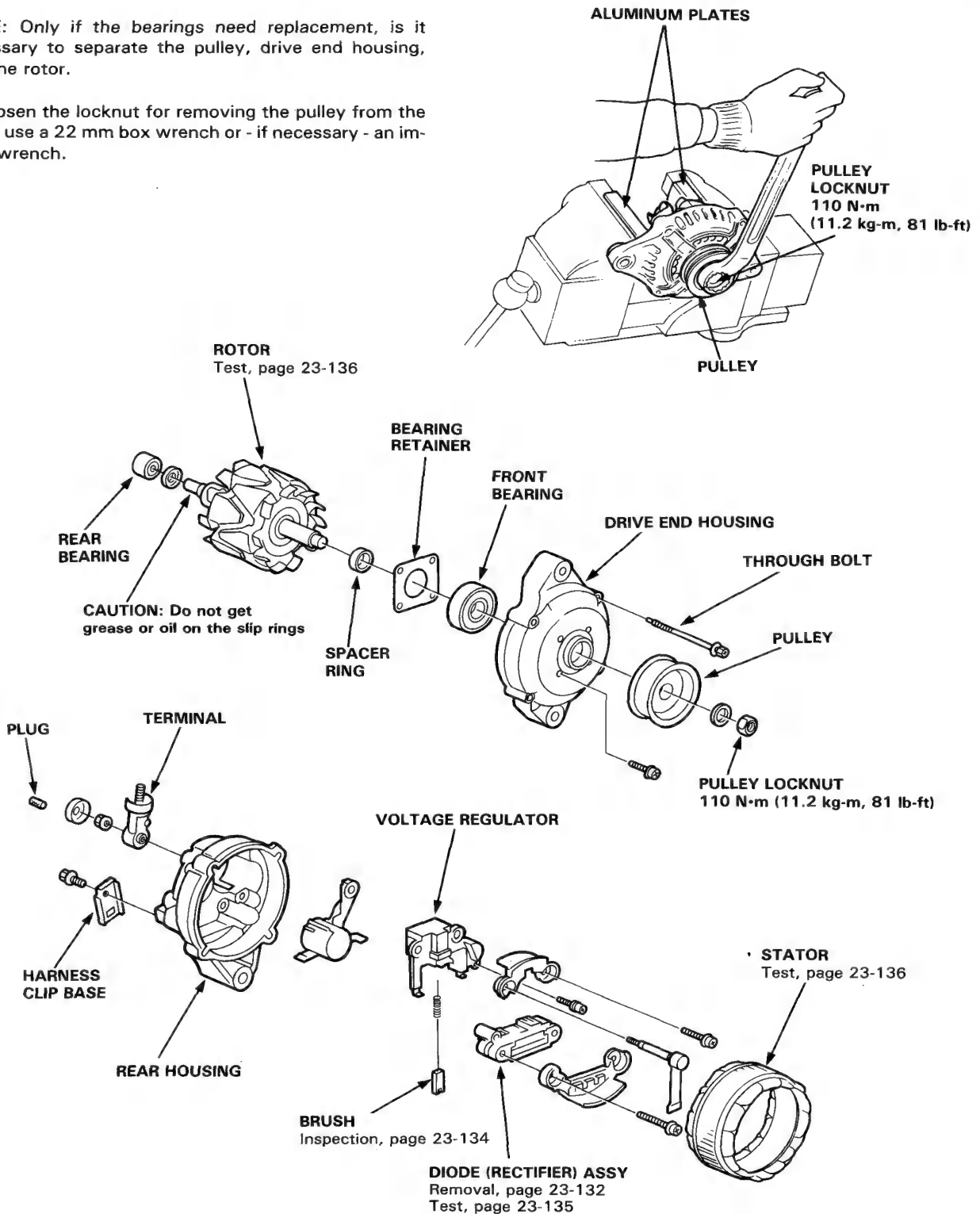




Alternator Overhaul (Mitsubishi Type)

NOTE: Only if the bearings need replacement, is it necessary to separate the pulley, drive end housing, and the rotor.

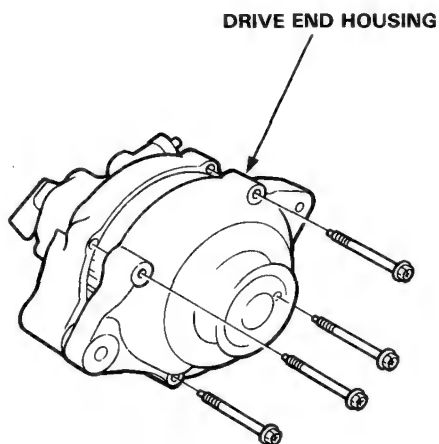
To loosen the locknut for removing the pulley from the rotor, use a 22 mm box wrench or - if necessary - an impact wrench.



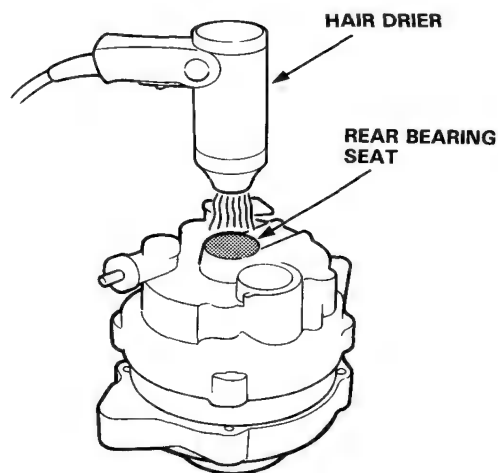
Charging System

Rectifier Removal (Mitsubishi Type)

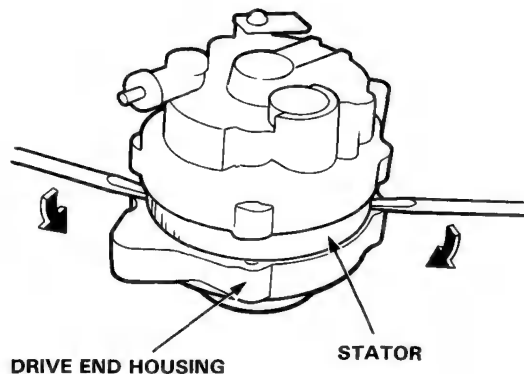
1. Remove the four through bolts.



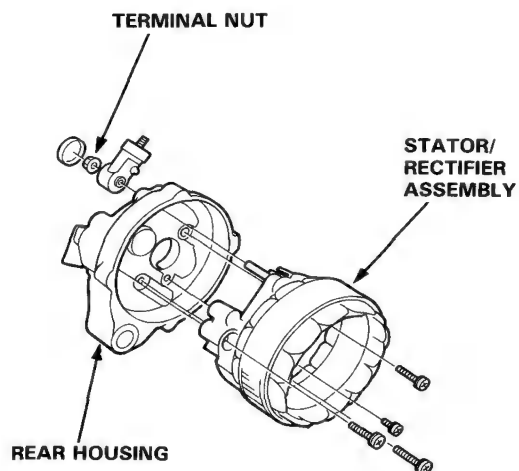
2. Heat the rear bearing seat with a 1000 W hair drier for about five minutes (50–60°C, 130°F).



3. Separate the rear housing from the drive end housing by inserting a flat tip screwdriver into the openings and prying them apart. Take care not to damage the stator with the tip of the screwdriver.



4. Separate the rear housing from the stator/rectifier assembly by removing the four screws and the terminal nut.

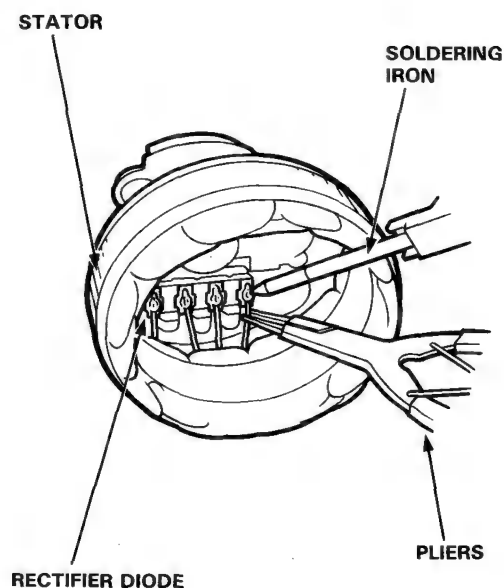




5. Unsolder the rectifier from the stator leads.

NOTE:

- To avoid damaging the diodes with heat, pinch the stator leads between pliers to carry heat off, and apply the soldering iron only long enough to separate the leads from the diode.
- Use a 100 W soldering iron.



6. Install the new rectifier in the reverse order of removal.
 - Apply the soldering iron only long enough to ensure a good connection so the heat will not damage the diodes.
 - Use only a rosin core type solder or solder joints will corrode.

Charging System

Alternator Brush Inspection

CAUTION: When replacing the brushes, use only a rosin core type solder or solder joints will corrode.

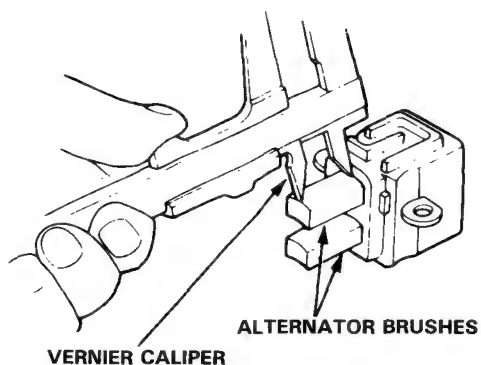
Nippondenso Type:

1. Remove the end cover, then take out the brush holder by removing its 2 screws.
2. Measure the length of the brushes with a vernier caliper.

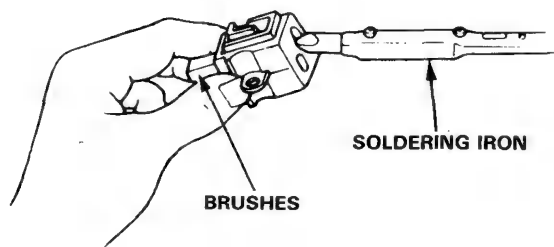
Alternator Brush Length:

Standard : 10.5 mm (0.41 in)

Service Limit: 5.5 mm (0.22 in)



If the brushes are not within the service limit, replace them.



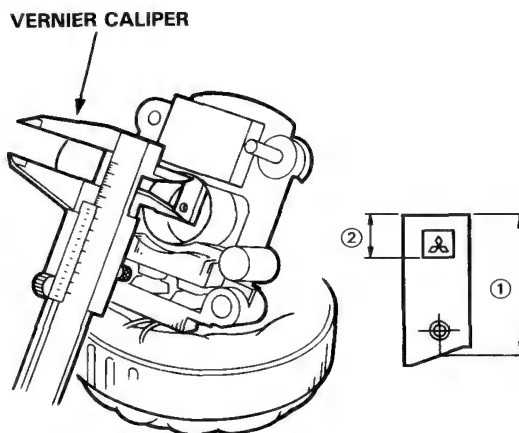
Mitsubishi Type:

1. Separate the drive end housing from the rear housing as described on page 23-132.
2. Separate the rear housing from the stator/rectifier assembly by removing the 4 screws and the terminal nut from the rear housing (see page 23-132).
3. Measure the length of the brushes with a vernier caliper.

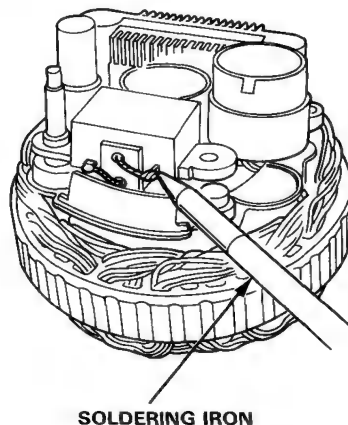
Alternator Brush Length:

① Standard : 22.0 mm (0.90 in)

② Service Limit: 8.0 mm (0.31 in)



If the brushes are not within the service limit, replace them.





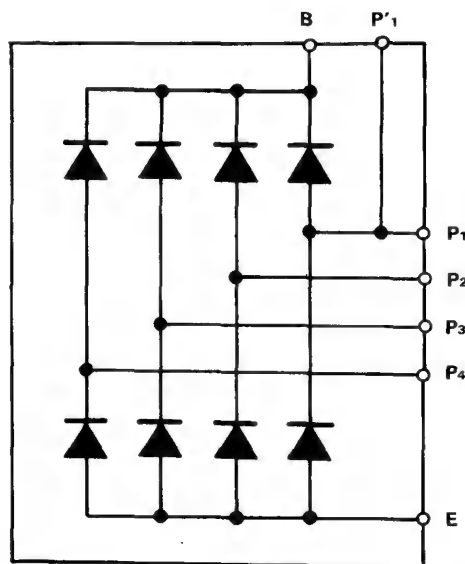
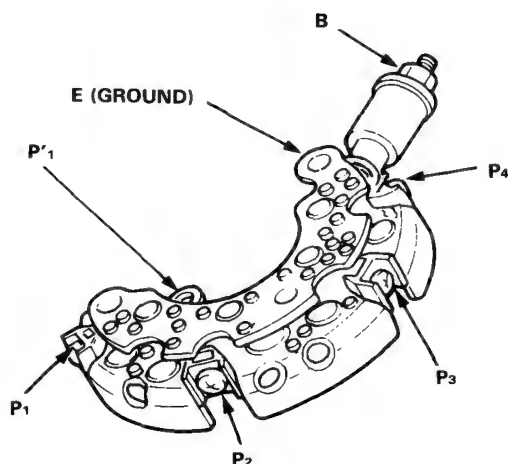
Rectifier Test

Nippondenso Type:

NOTE:

- The diodes are designed to allow current to pass in one direction while blocking the opposite direction. Each diode must be tested for continuity in both directions. Since the rectifier is made up of eight diodes, there are a total of 16 checks.
- Use an ohmmeter capable of checking diodes.

1. Check for continuity in each direction between the B and P terminals, and between the E (ground) and P terminals of each diode pair. All diodes should have continuity in only one direction.



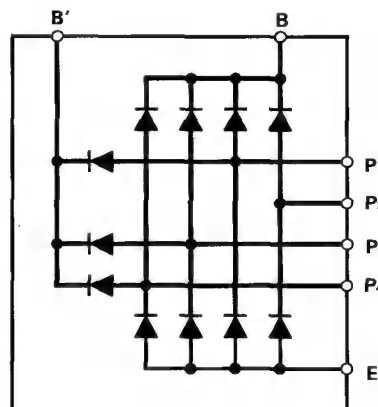
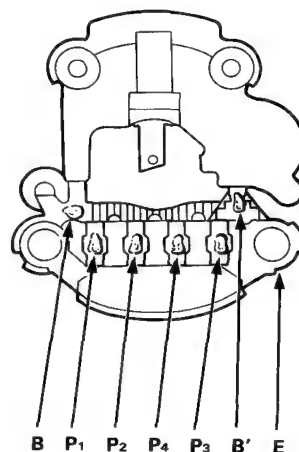
2. If any of the eight diodes fails, replace the rectifier assembly (diodes are not available separately).

Mitsubishi Type:

NOTE:

- The diodes are designed to allow current to pass in one direction while blocking the opposite direction. Each diode must be tested for continuity in both directions. Since the rectifier is made up of eleven diodes, there are a total of 22 checks.
- Use an ohmmeter capable of checking diodes.

1. Check for continuity in each direction between the B and P terminals, E (ground) and P terminals, and between the B' and P (except P4) terminals of each diode pair. All diodes should have continuity in only one direction.

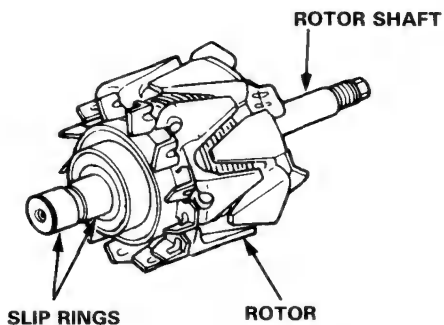


2. If any of the eleven diodes fails, replace the rectifier assembly (diodes are not available separately).

Charging System

Rotor Slip Ring Test

1. Check that there is continuity between the slip rings.
2. Check that there is no continuity between the slip rings and the rotor or rotor shaft.

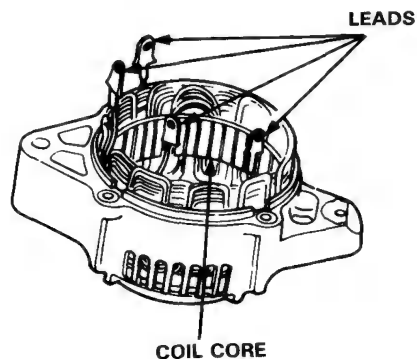


If the rotor fails either continuity check, replace the alternator.

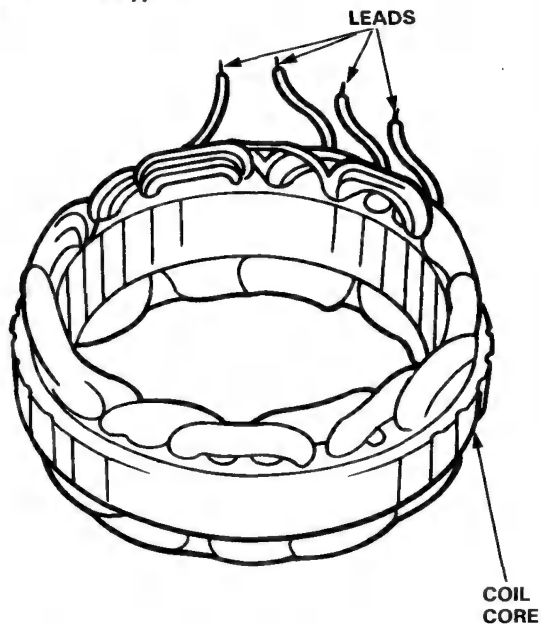
Stator Test

1. Check that there is continuity between each pair of leads.
2. Check that there is no continuity between each lead and the coil core.

Nippondenso Type:



Mitsubishi Type:

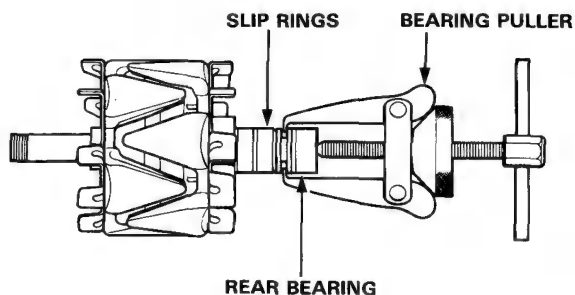


3. If the coil core fails either continuity check, replace the alternator.

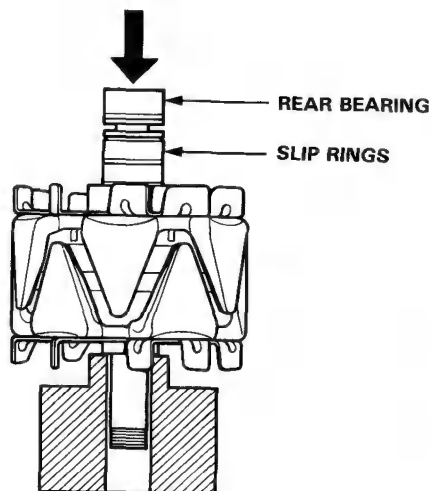


Rear Bearing Replacement (Mitsubishi Type)

1. Pull off the rear bearing.
 - Make sure the tips of the bearing puller jaws are thin enough to fit between the bearing and the slip rings.
 - Do not reuse the bearing.

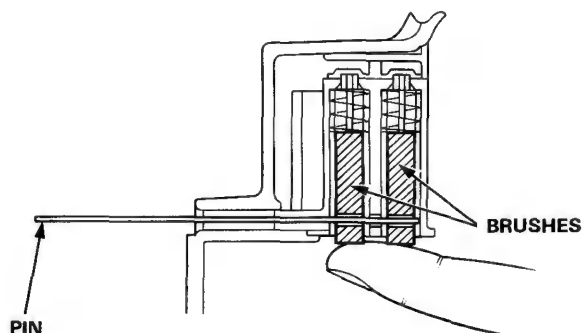


2. Use a hand press to install the new bearing. Apply pressure only on the inner race to avoid damaging the bearing.

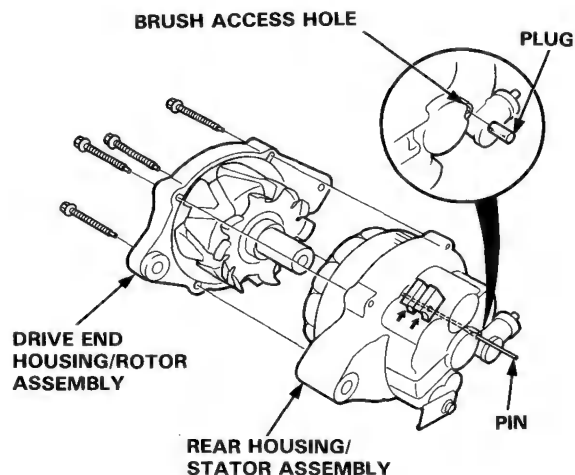


Alternator Reassembly (Mitsubishi Type)

1. Push the brushes in so the holes in them line up with the hole in the housing, then insert a pin or drill bit (about 1.8 mm diameter) to hold them there.



2. Heat the rear bearing seat in the rear housing as described on page 23-120. After heating, continue immediately with assembling before the rear bearing seat cools completely.
3. Put the rear housing/stator assembly and drive end housing/rotor assembly together, tighten the four through bolts, pull out the pin, and plug the brush access hole.



4. After assembling, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.

Charging System

Alternator Belt Inspection and Adjustment

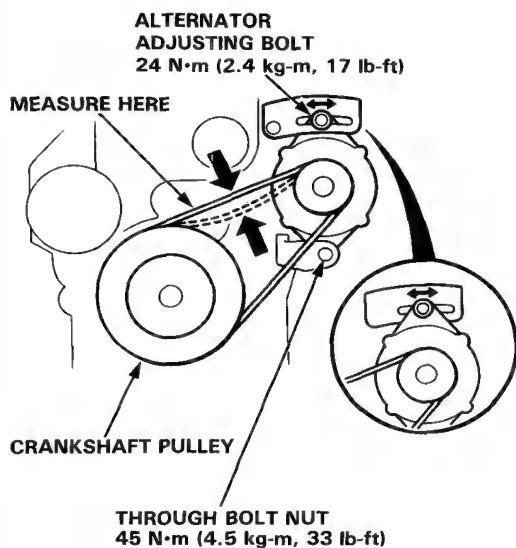
Deflection method:

Apply a force of 100 N (10 kg, 22 lb) and measure the belt deflection between the alternator and the crankshaft pulley.

Deflection: 7.0–10.5 mm (0.28–0.41 in)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the deflection should be 5.5–8.0 mm (0.22–0.31 in) or 5.0–7.0 mm (0.20–0.28 in) (B16A 2 engine) when first measured.
- If there are cracks or any damage evident in the belt, replace it with a new one.



If adjustment is necessary:

1. Loosen the alternator adjusting bolt or adjusting nut (B16A 2 engine) and the through bolt nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting bolt or adjusting nut (B16A 2 engine) and the through bolt nut to the specified torques.
3. Recheck the deflection of the belt.

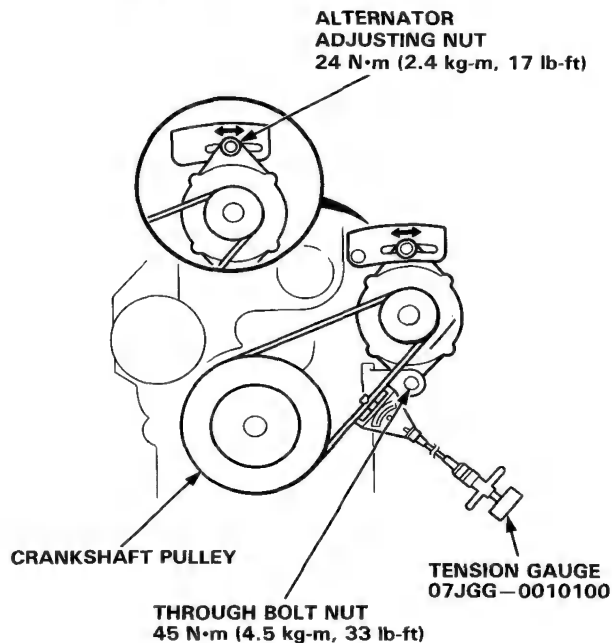
Tension gauge method:

Attach the belt tension gauge to the belt and measure the belt tension.

Tension: 343–490 N (35–50 kg, 77–110 lb)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the tension should be 540–735 N (55–75 kg, 121–165 lb) or 687–883 N (70–90 kg, 154–198 lb) (B16A 2 engine) when first measured.
- Follow the manufacturer's instructions for the belt tension gauge.
- If there are cracks or any damage evident in the belt, replace it with a new one.



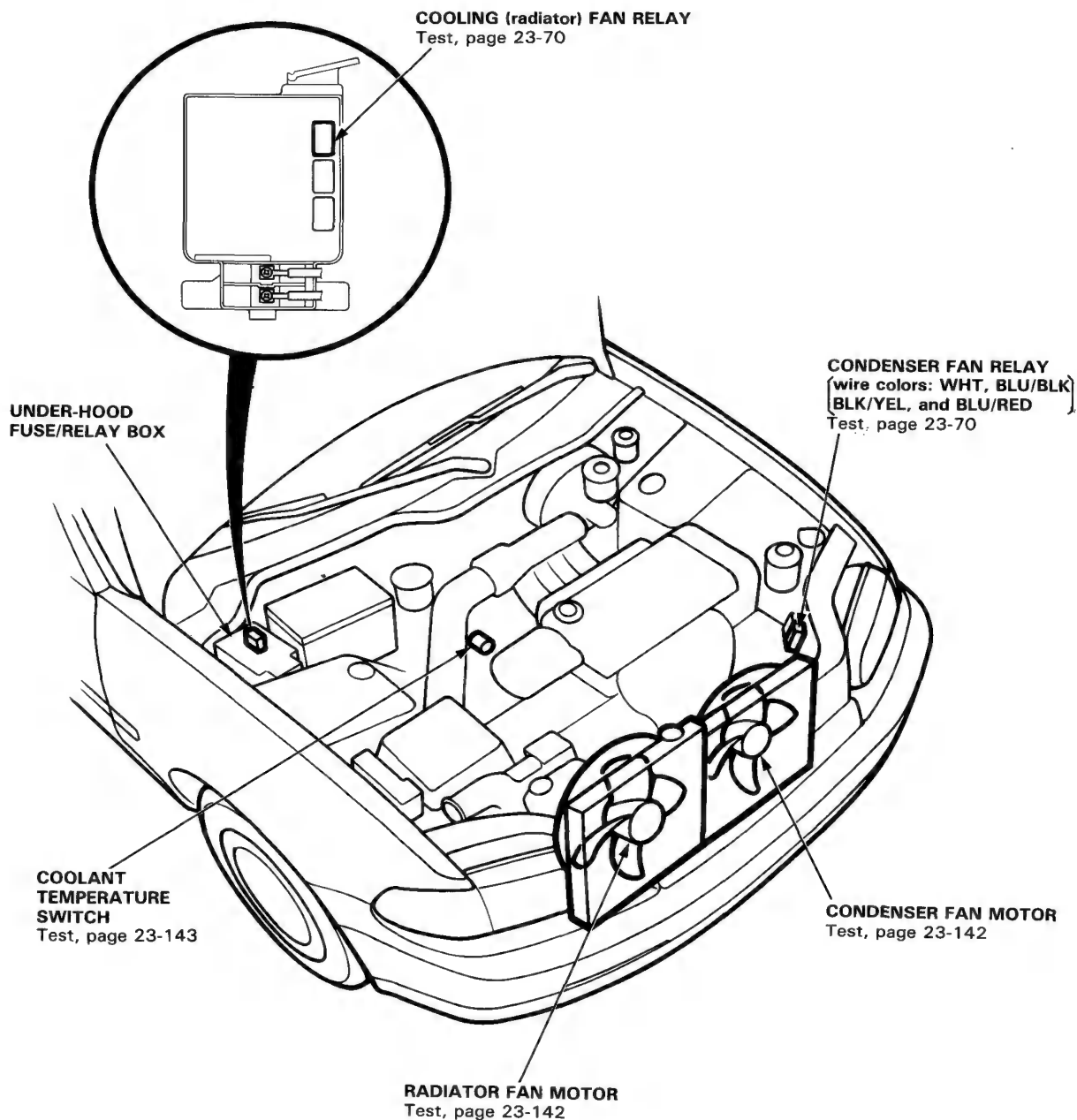
If adjustment is necessary:

1. Loosen the alternator adjusting bolt or adjusting nut (B16A 2 engine) and the through bolt nut.
2. Move the alternator to obtain the proper belt tension, then retighten the adjusting bolt or adjusting nut (B16A 2 engine) and the through bolt nut to the specified torques.
3. Recheck the tension of the belt.

Radiator and Condenser Fan Controls

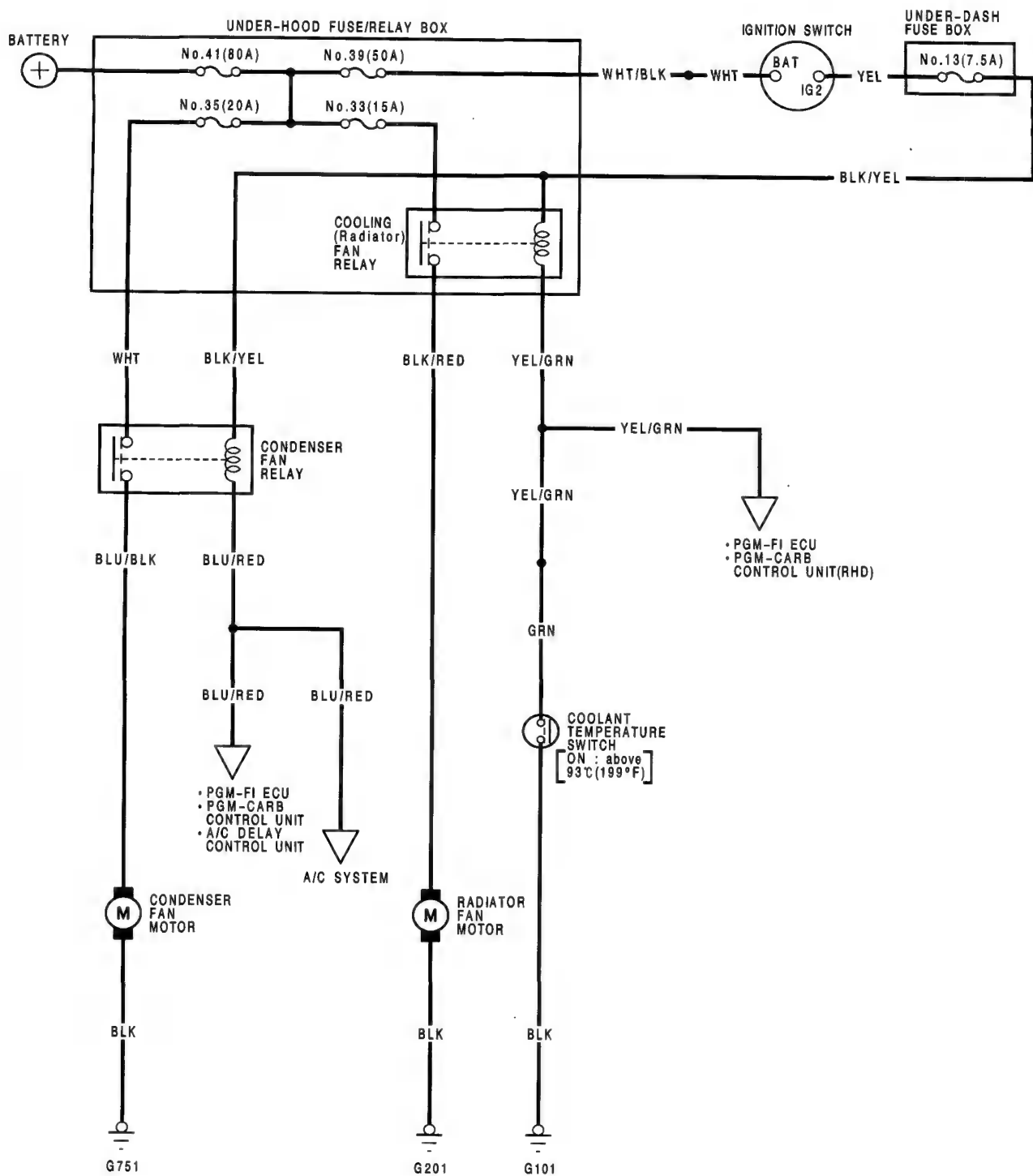


Component Location Index



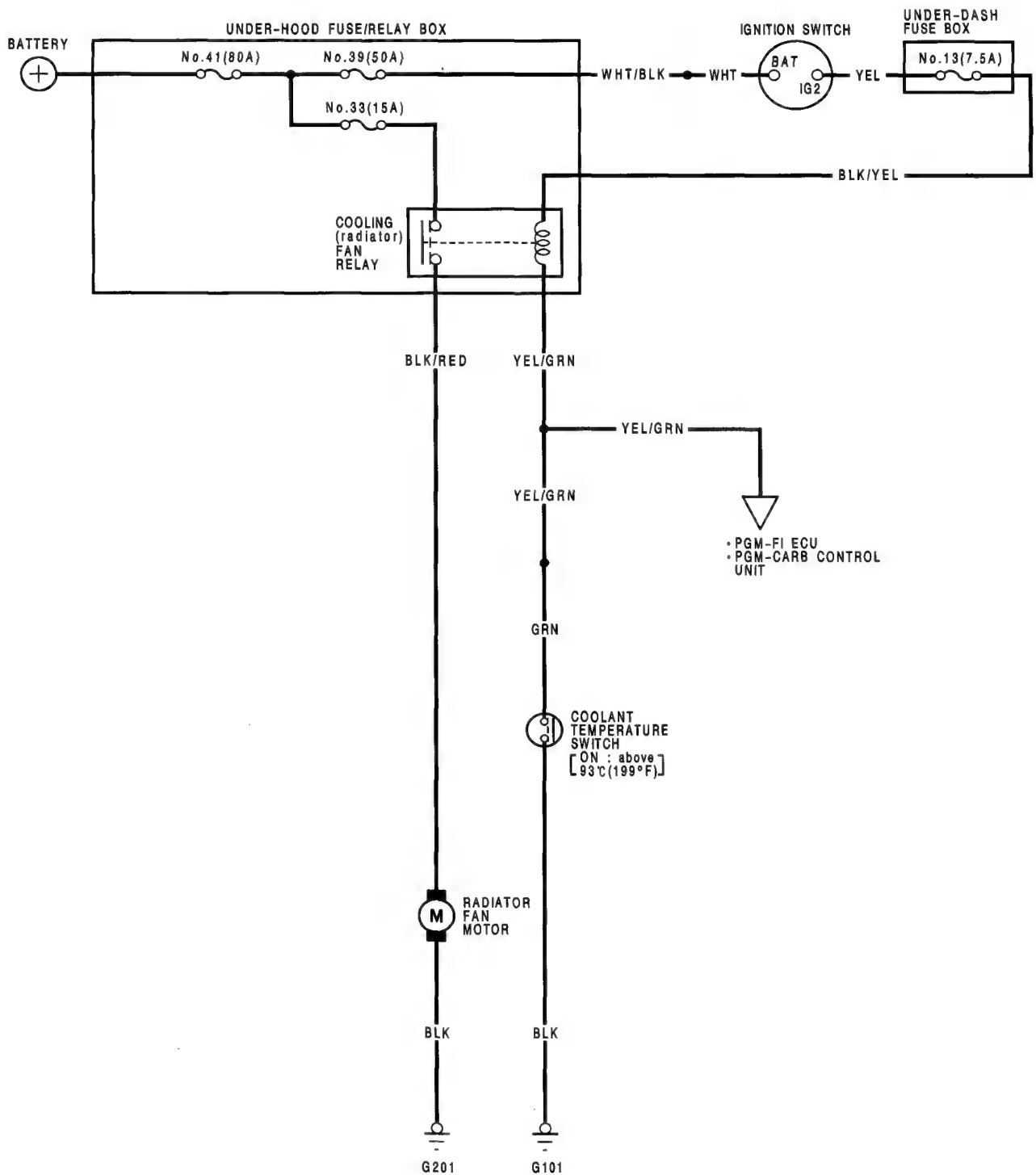
Radiator and Condenser Fan Controls

Circuit Diagram (With A/C)





Circuit Diagram (Without A/C)

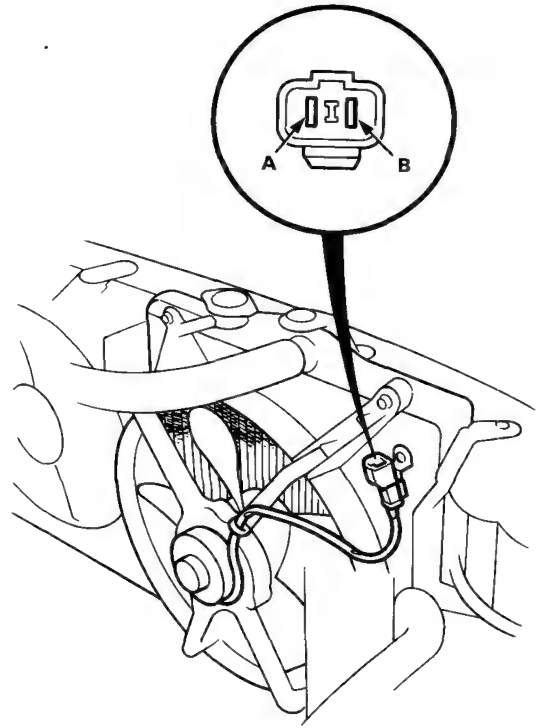


Radiator and Condenser Fan Controls

Fan Motor Test

1. Disconnect the 2-P connector from the fan motor.
2. Test motor operation by connecting battery power to the B terminal, and ground to the A terminal.
3. If the motor fails to run smoothly, replace it.

NOTE: The illustration shows the radiator fan.

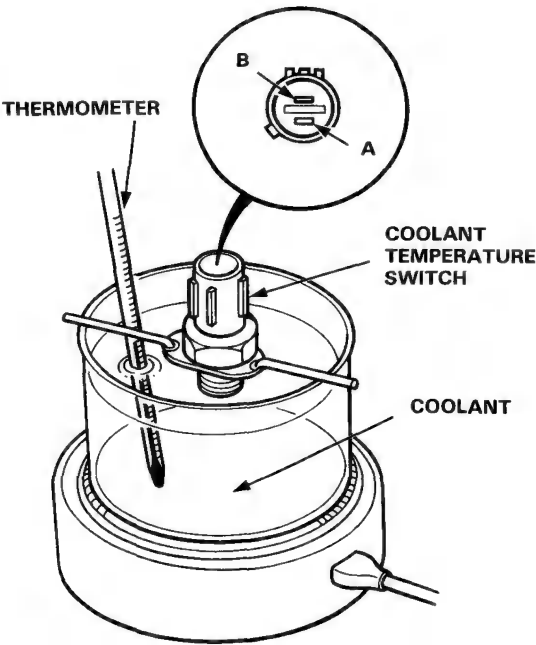




Coolant Temperature Switch Test

NOTE: Bleed air from the cooling system after installing the coolant temperature switch (see Section 10).

1. Remove the coolant temperature switch from the thermostat housing.
2. Suspend the coolant temperature switch in a container of coolant as shown.



3. Heat the coolant and check coolant temperature with a thermometer.
4. Check for continuity between the A and B terminals according to the table.

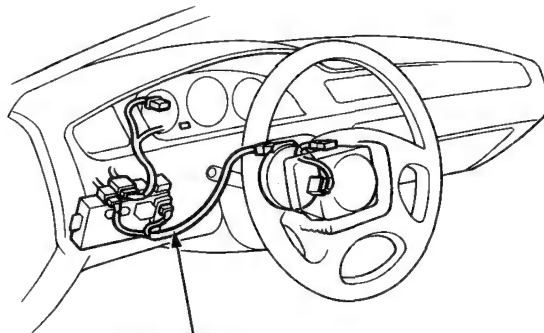
Terminal			A	B
Temperature				
SWITCH	ON	91°-95°C (196°-203°F)	<input type="radio"/>	<input type="radio"/>
	OFF	3°-8°C lower than the temperature when it goes on.		

Gauge Assembly

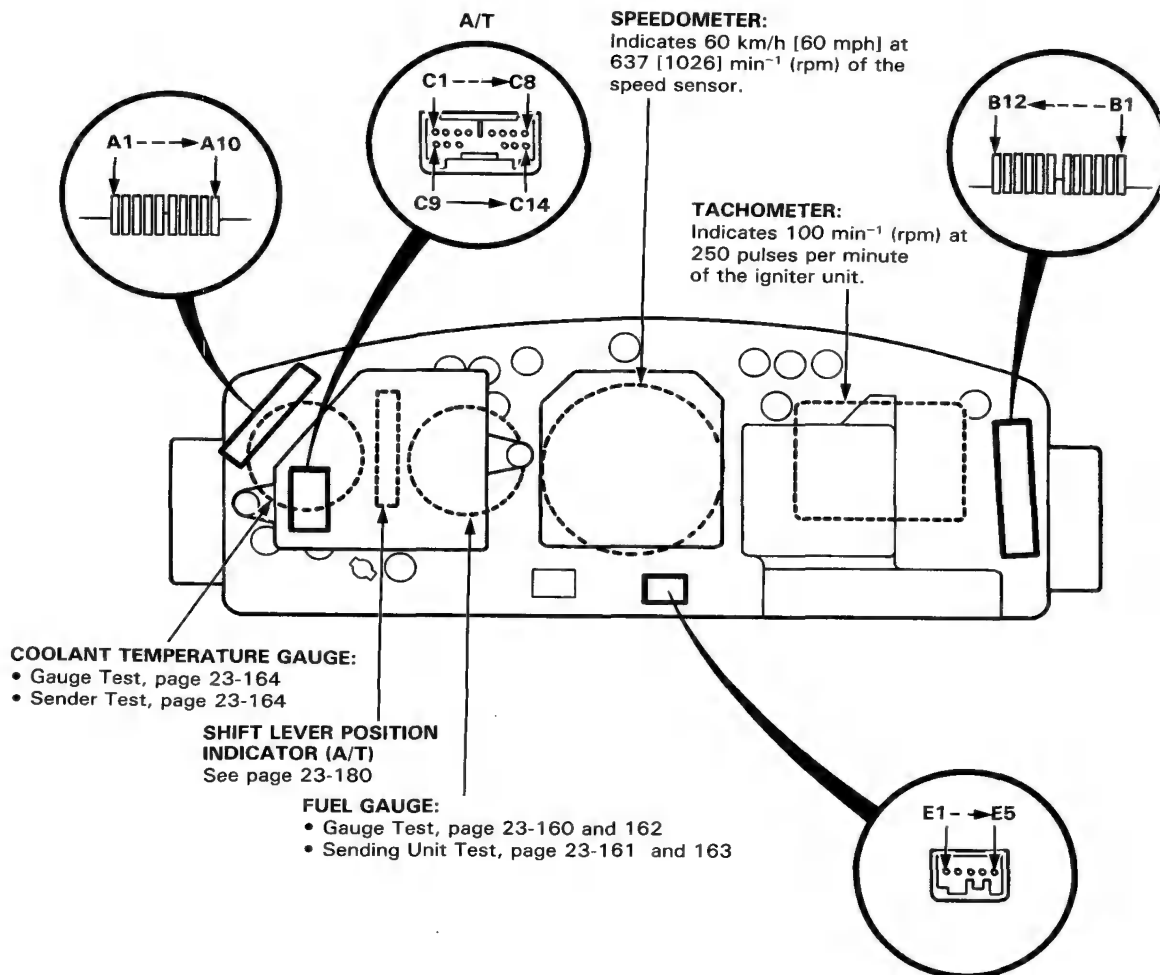
Gauge/Indicator Location Index (With Tachometer)

CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

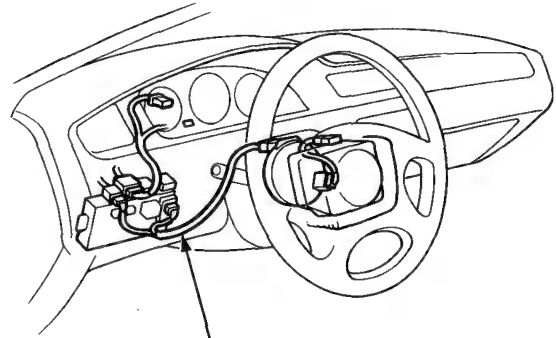




Gauge/Indicator Location Index (Without Tachometer)

CAUTION (with SRS):

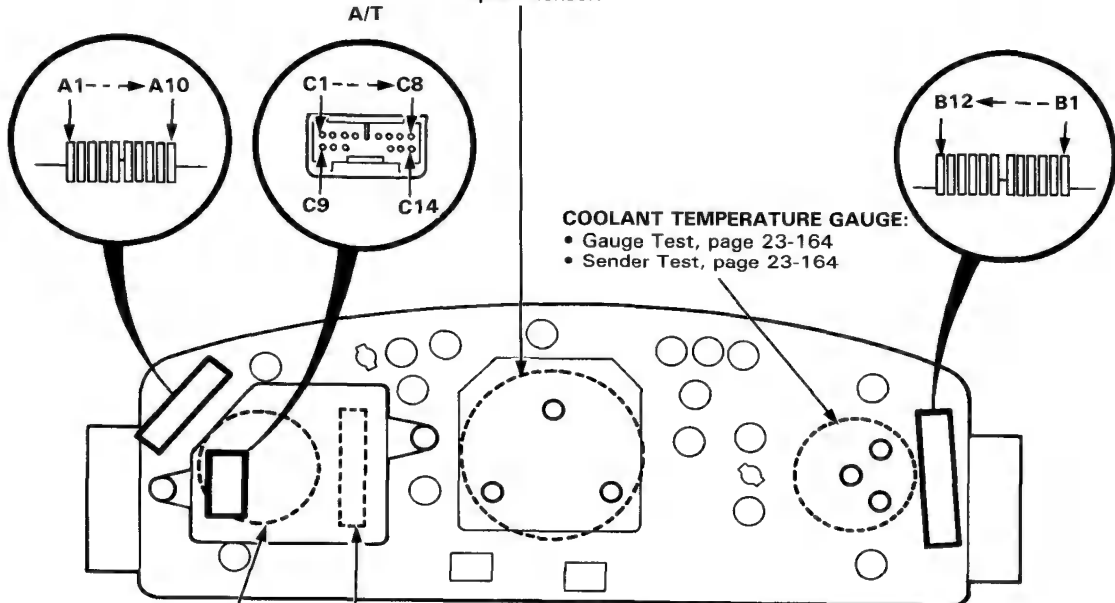
- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

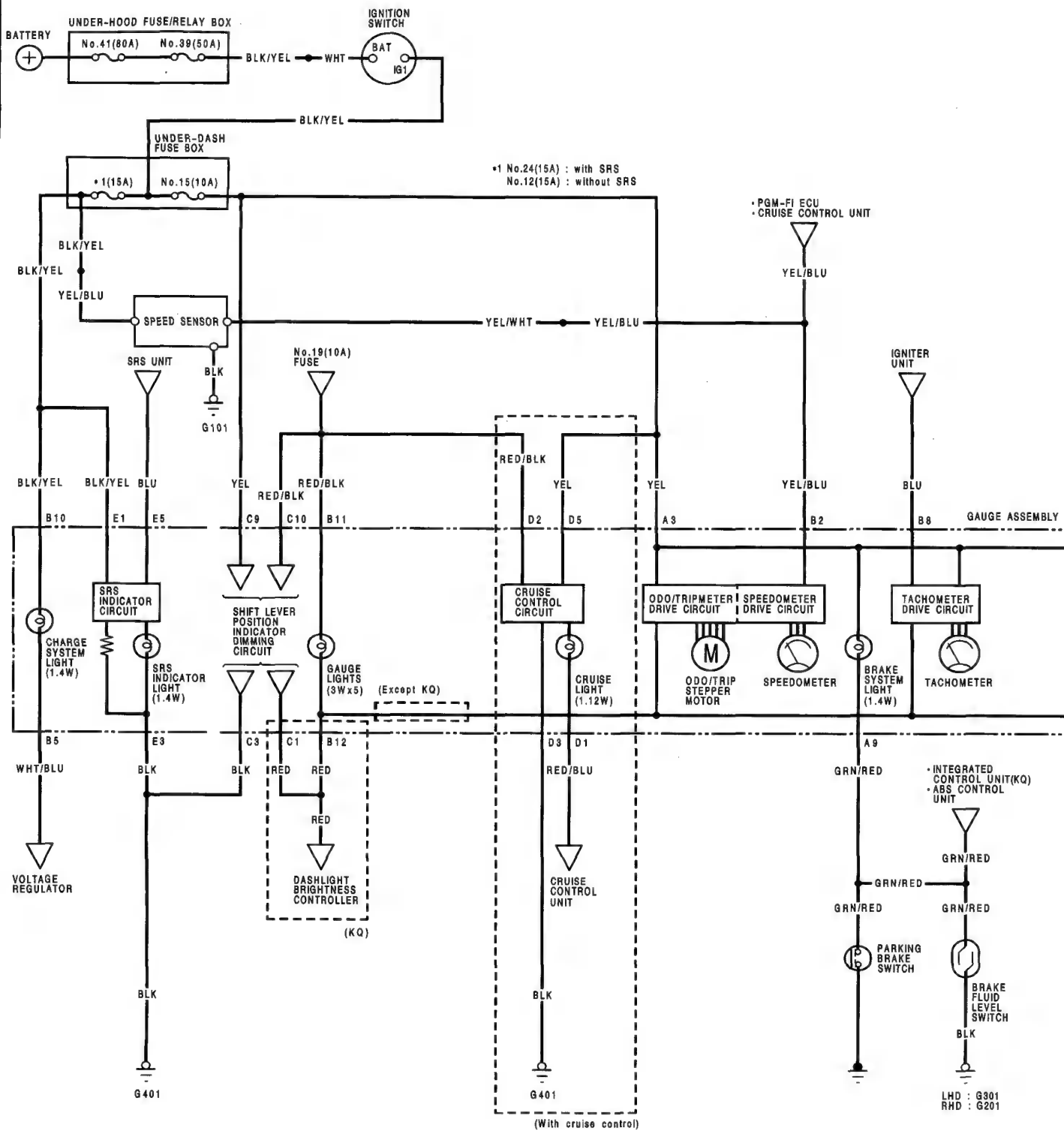
SPEEDOMETER:

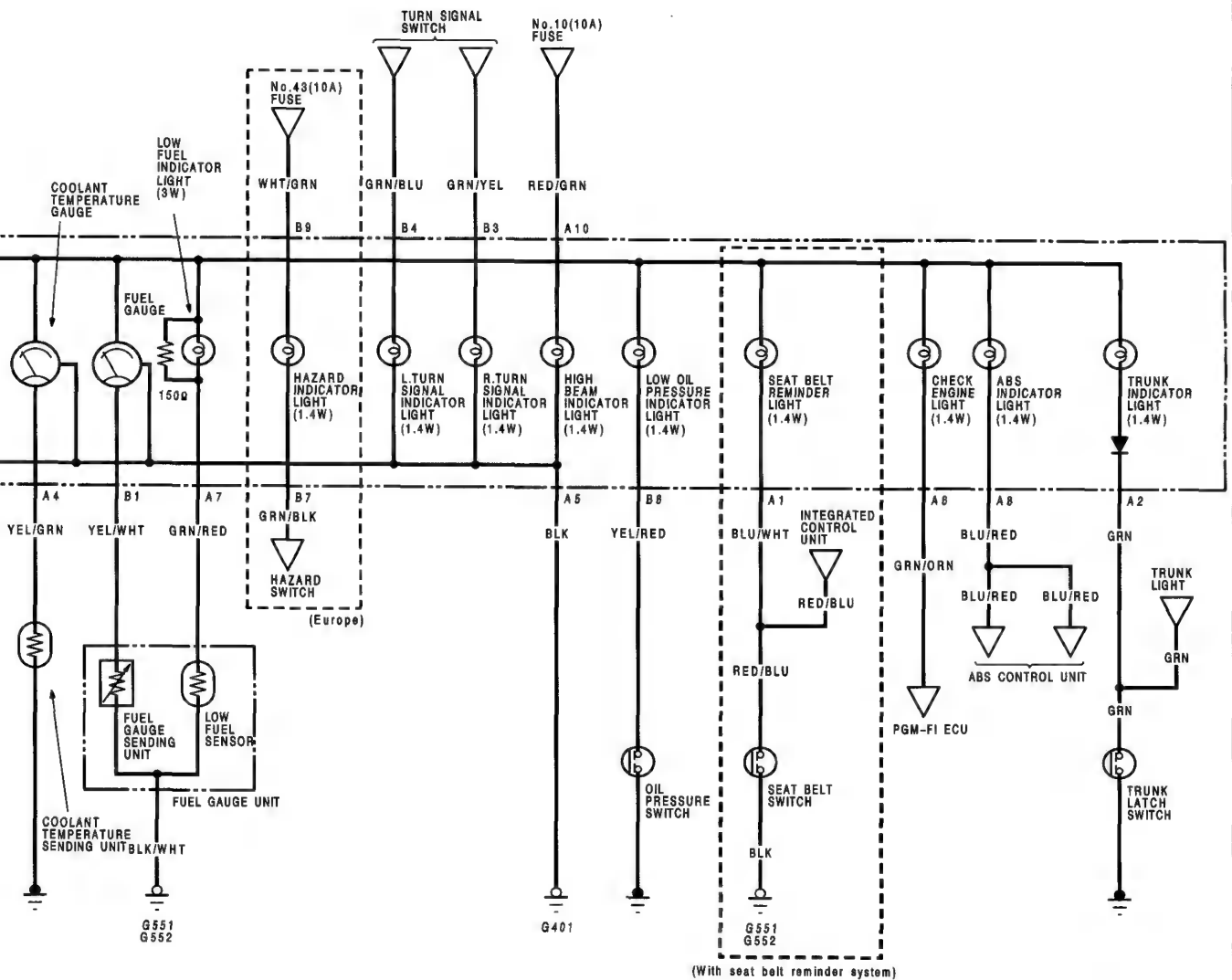
Indicates 60 km/h [60 mph] at 637 [1026] min⁻¹ (rpm) of the speed sensor.



Gauge Assembly

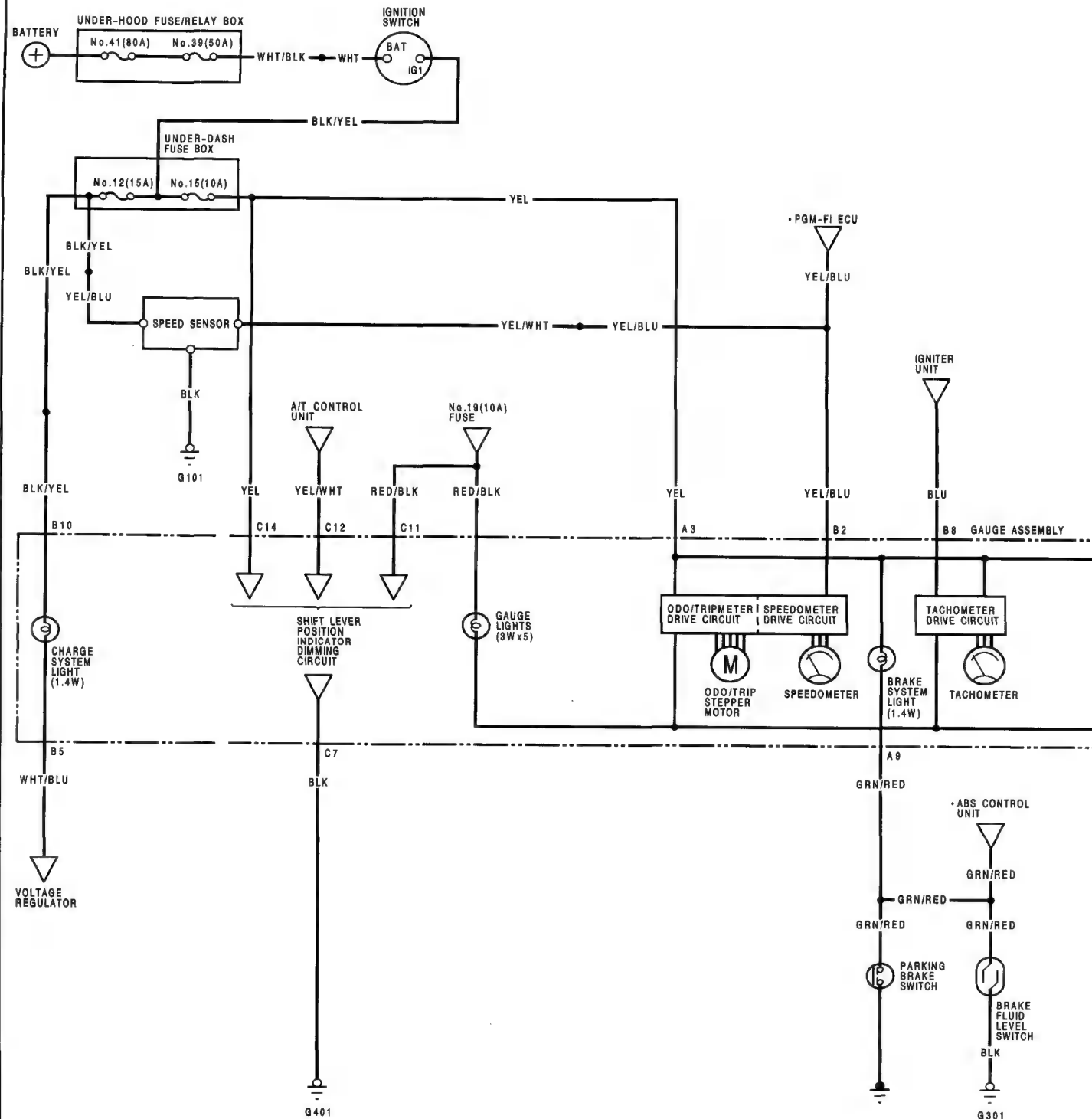
Circuit Diagram (With Tachometer: Except 4WD)

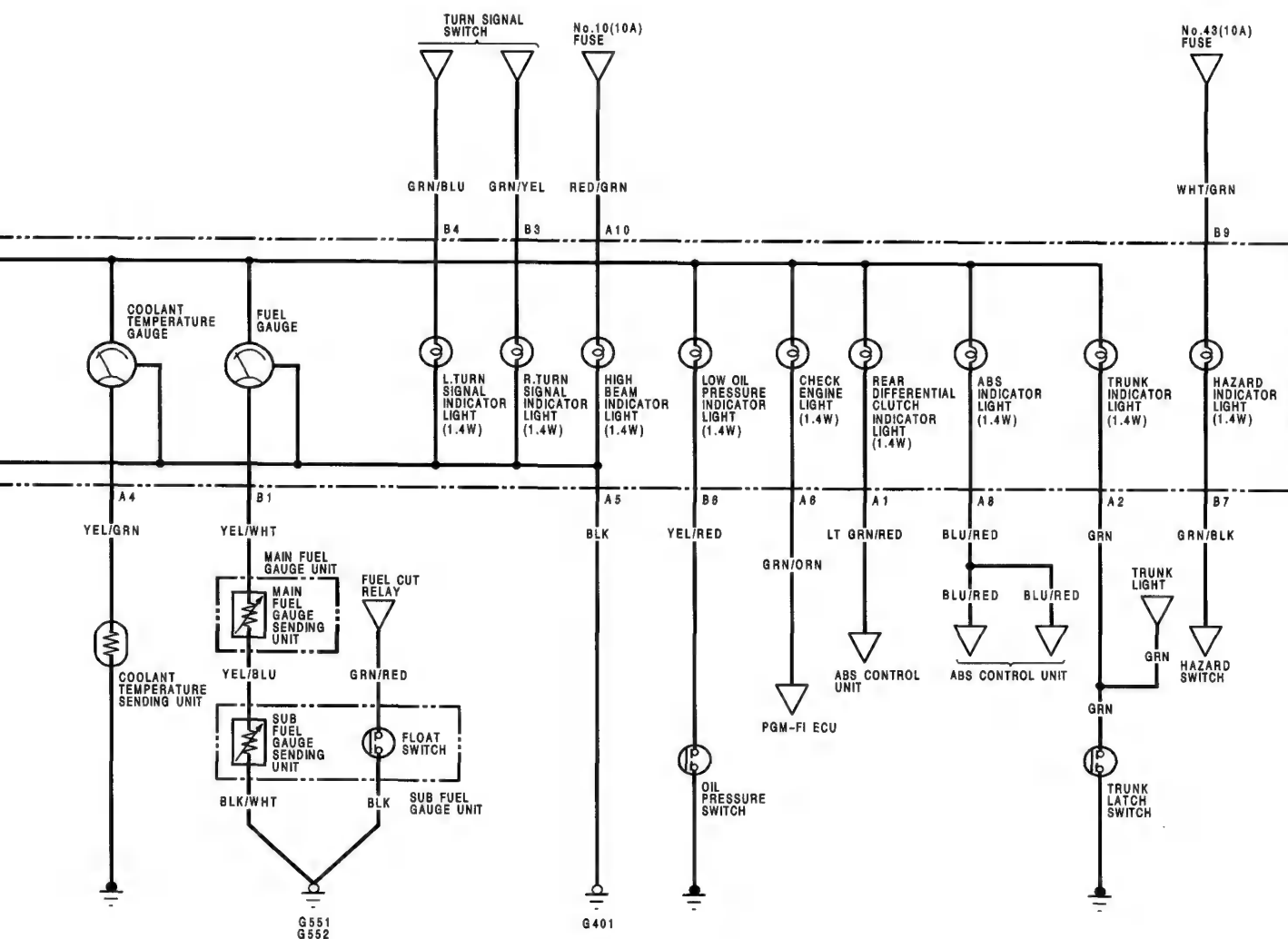




Gauge Assembly

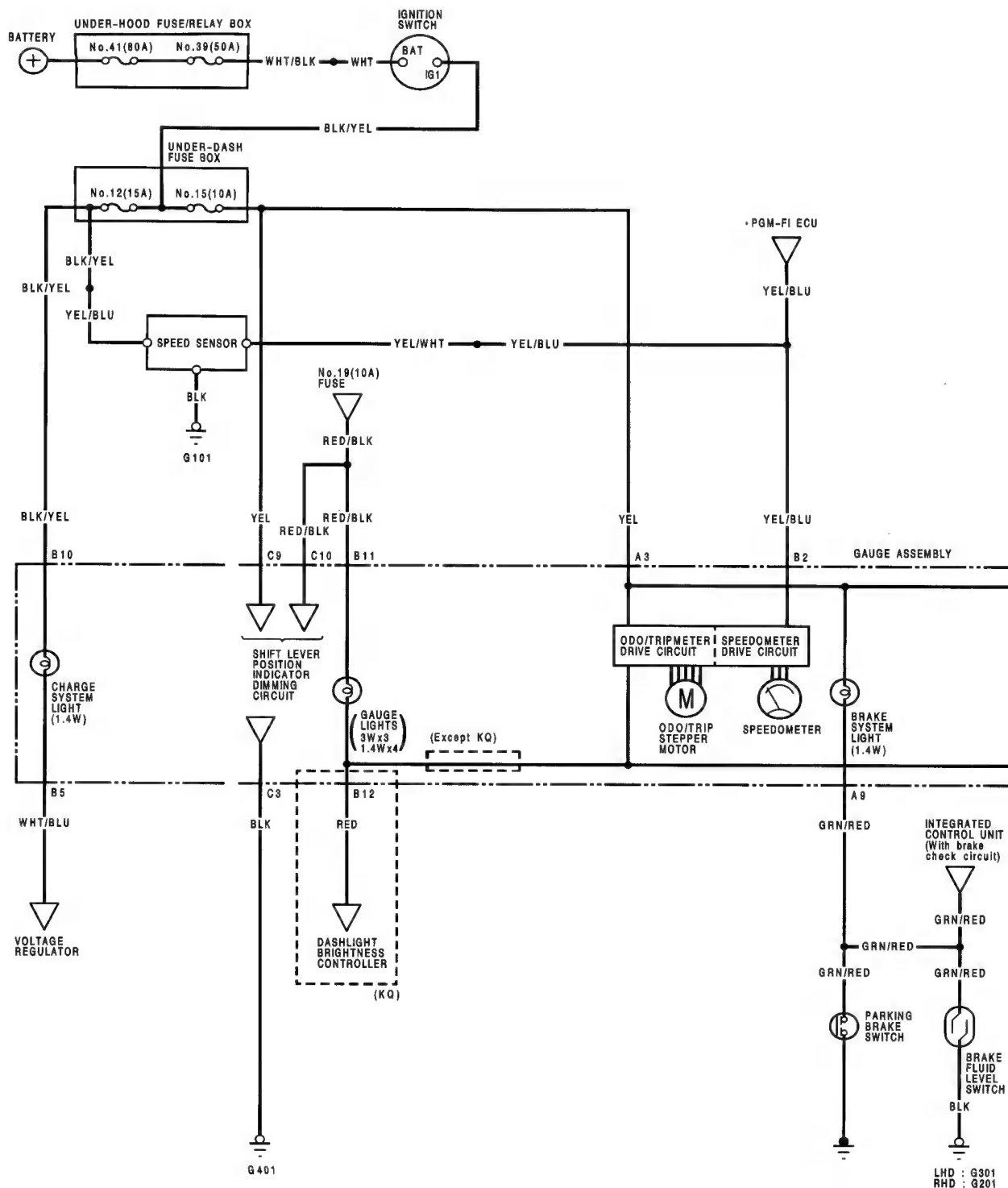
Circuit Diagram (With Tachometer: 4WD)

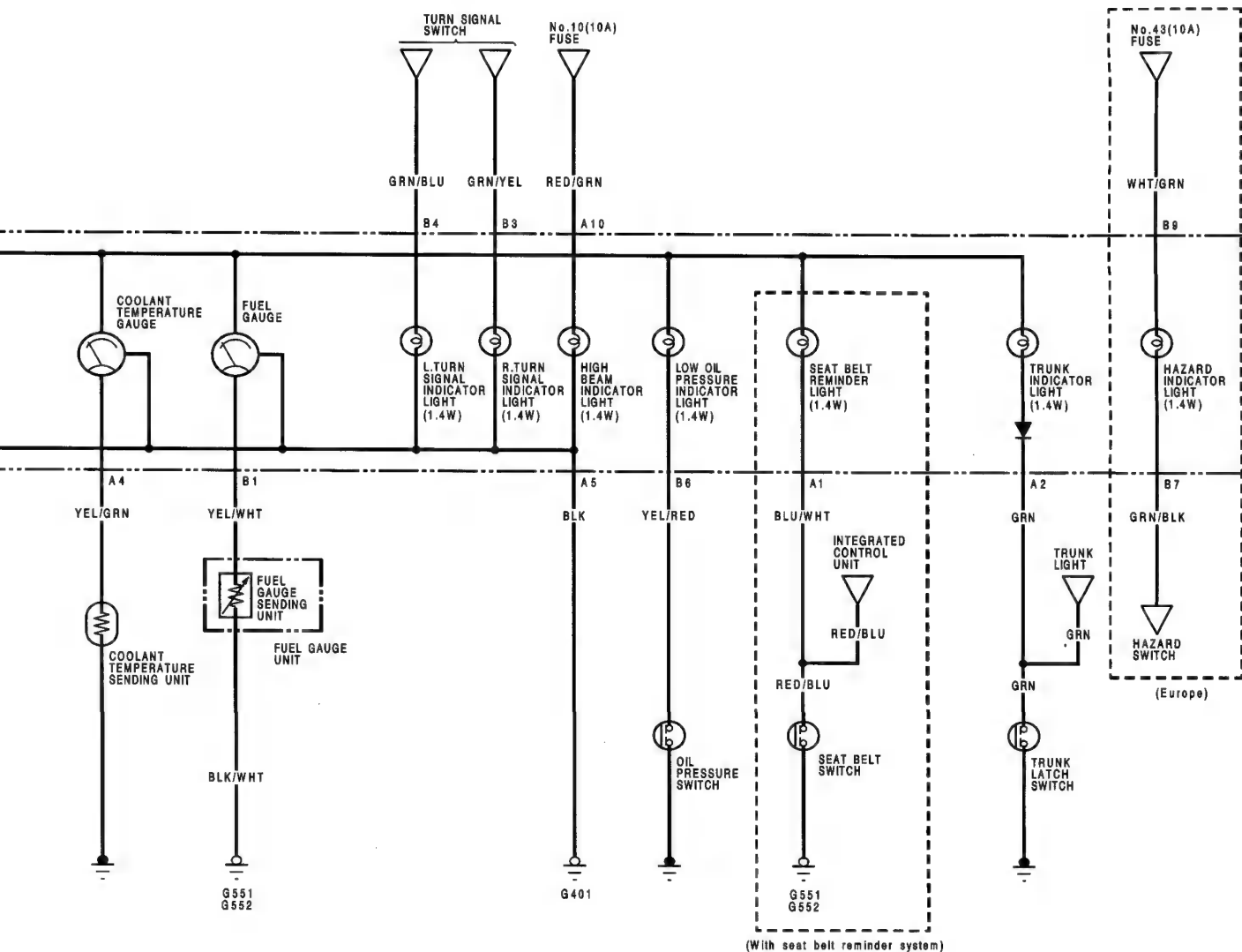




Gauge Assembly

Circuit Diagram (Without Tachometer)



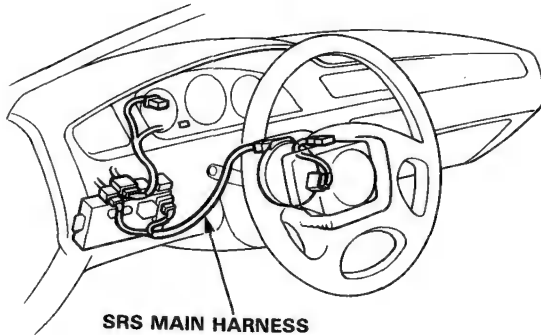


Gauge Assembly

Removal

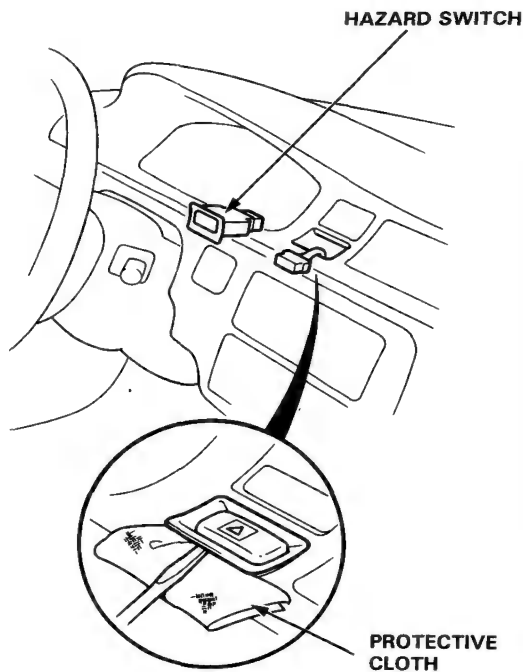
CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

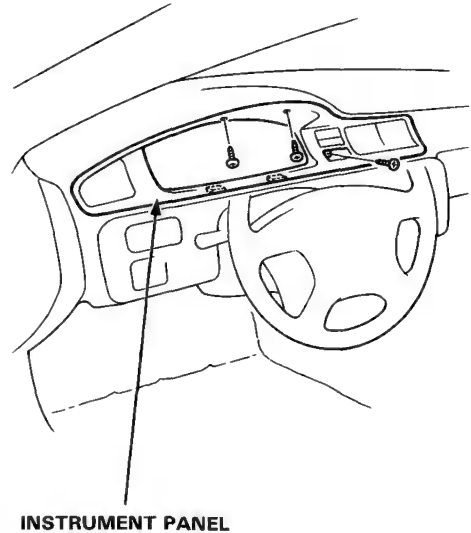


NOTE: RHD type is symmetrical to LHD type.

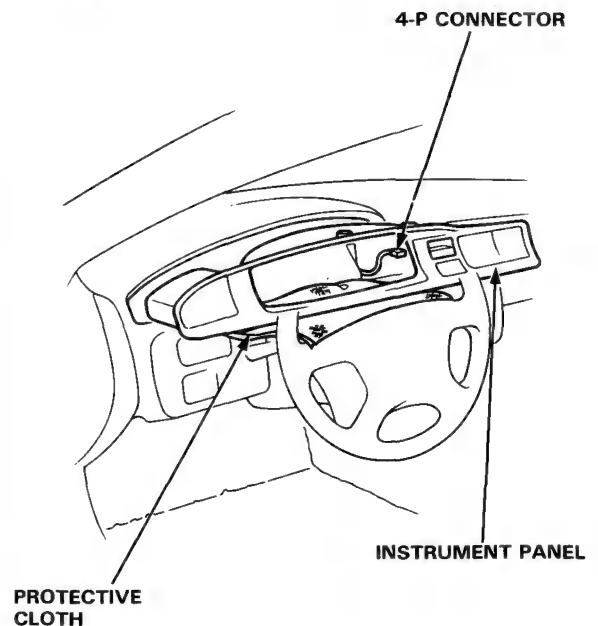
1. Carefully pry the hazard switch out of the instrument panel.



2. Remove the 3 screws, then remove the instrument panel from the dashboard.

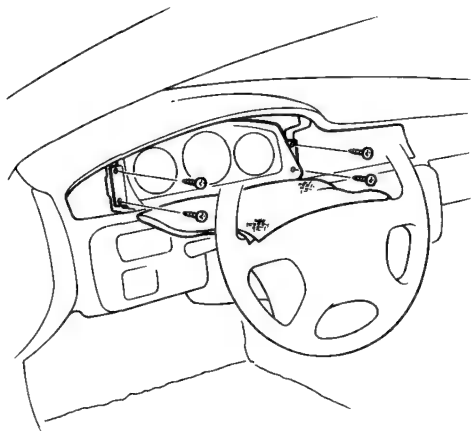


3. Disconnect the 4-P connector from the instrument panel.

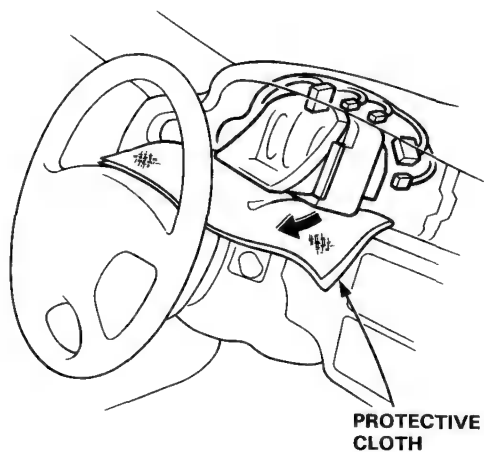




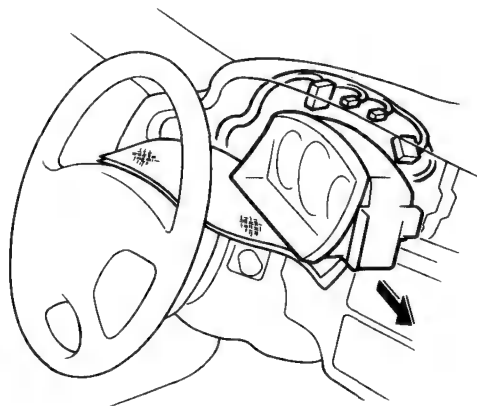
4. Remove the 4 screws from the gauge assembly, and pull the assembly out.



5. Disconnect the connectors from the gauge assembly.



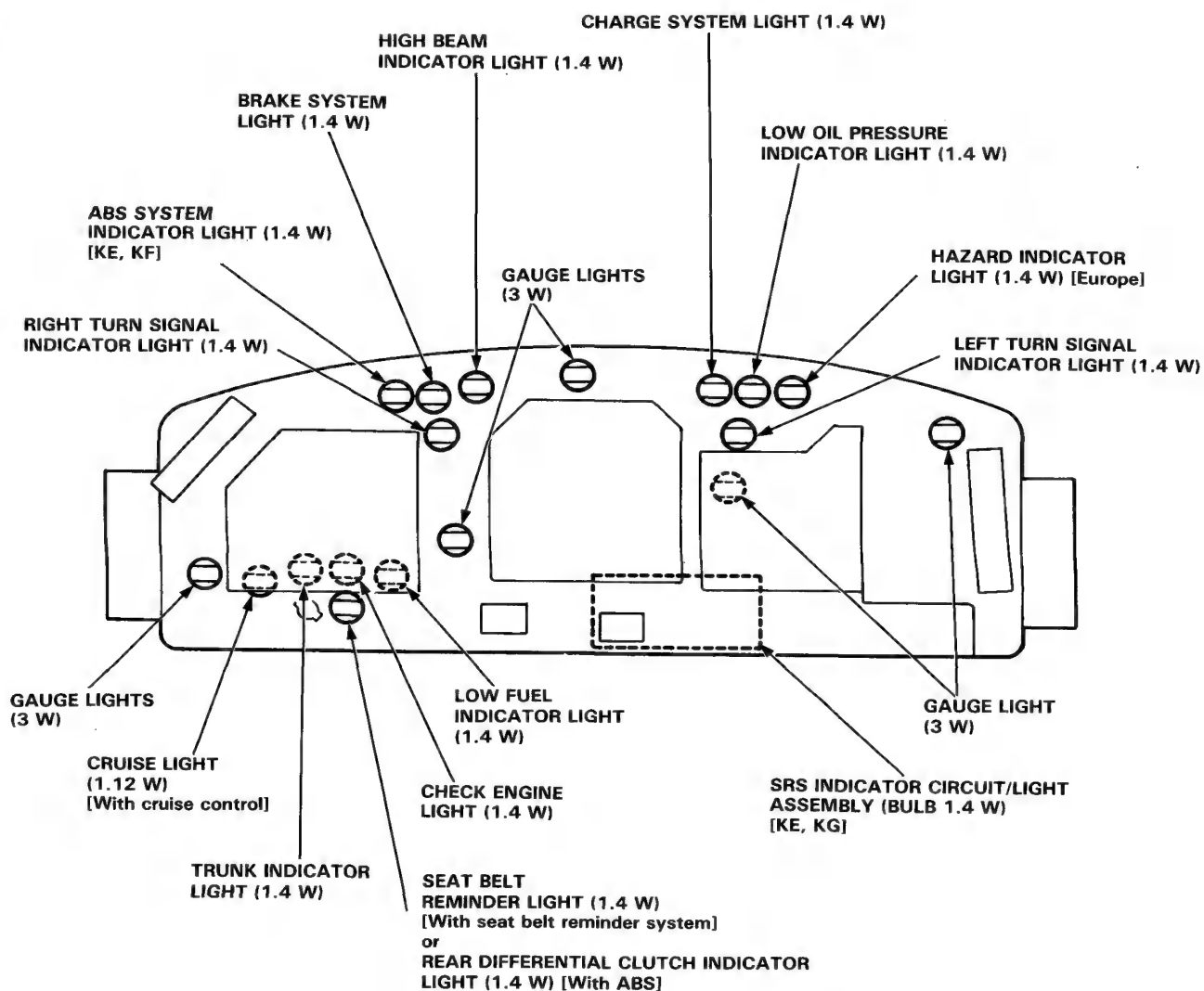
6. Carefully lift the gauge assembly away from the dashboard.



7. Install the gauge assembly in the reverse order of removal. After installation, check the operation of all lights and gauges, including the SRS indicator light.

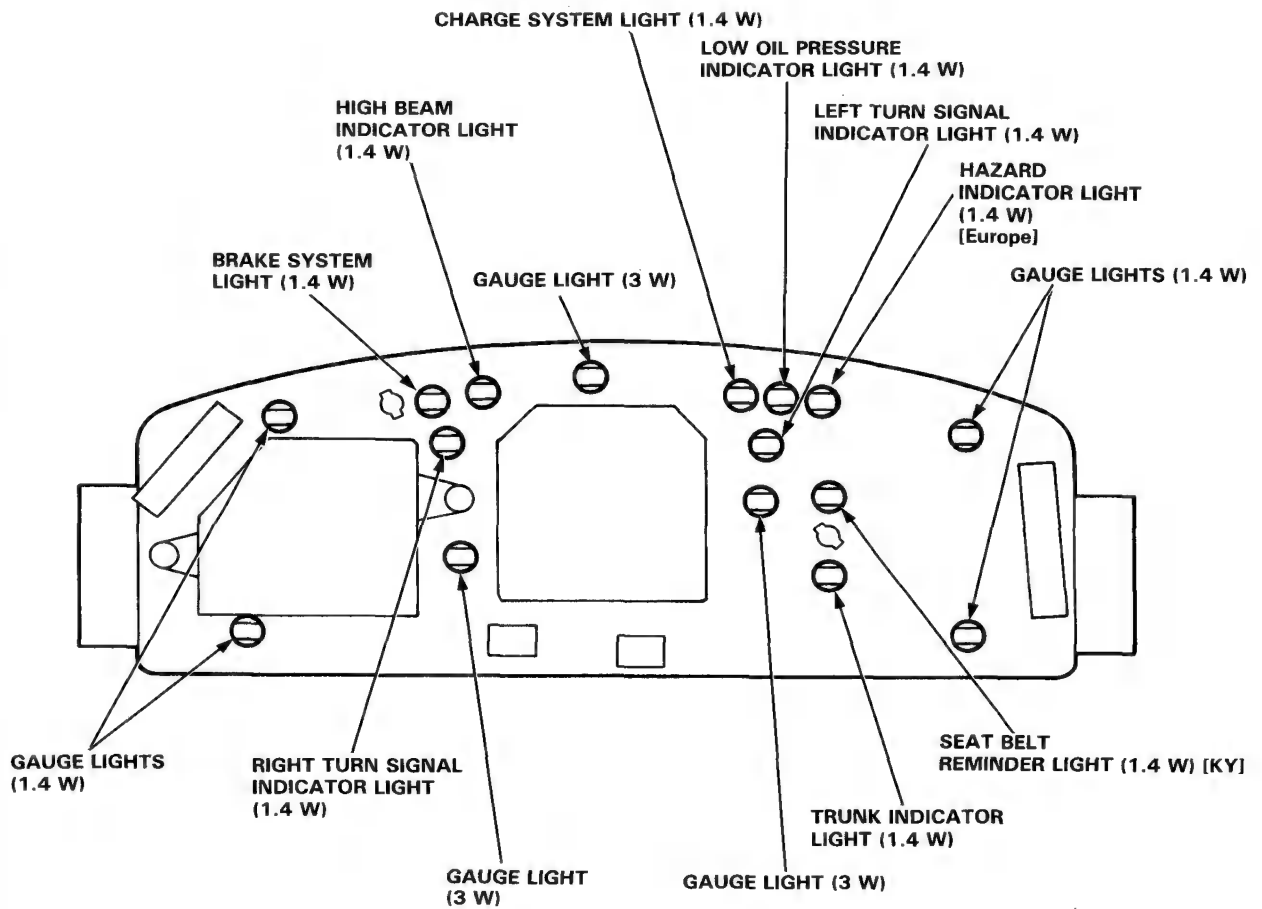
Gauge Assembly

Bulb Locations (With Tachometer)





Bulb Locations (Without Tachometer)



Gauge Assembly

Disassembly (With Tachometer)

NOTE:

- Handle the terminals and printed circuit boards carefully to avoid damaging them.
- If replacement is required, replace the speedometer and tachometer as a unit.

FUEL and COOLANT TEMPERATURE
GAUGE MOUNTING SCREWS (x 6)

TACHOMETER MOUNTING
SCREWS (x 3)

SHIFT LEVER POSITION
INDICATOR MOUNTING SCREWS
(x 2)

SPEEDOMETER MOUNTING
SCREWS (x 3)

PRINTED CIRCUIT
BOARD

SHIFT LEVER POSITION
INDICATOR ASSEMBLY (A/T)

SPEEDOMETER and
ODO/TRIP METER
Specification, page 23-144 and 145

TACHOMETER
Specifications, page 23-144

HOUSING

CRUISE CONTROL DIMMING
CIRCUIT/LIGHT ASSEMBLY
(With cruise control)

SRS INDICATOR
CIRCUIT ASSEMBLY
(KE, KG)

TRIP METER RESET
BUTTON

METER VISOR

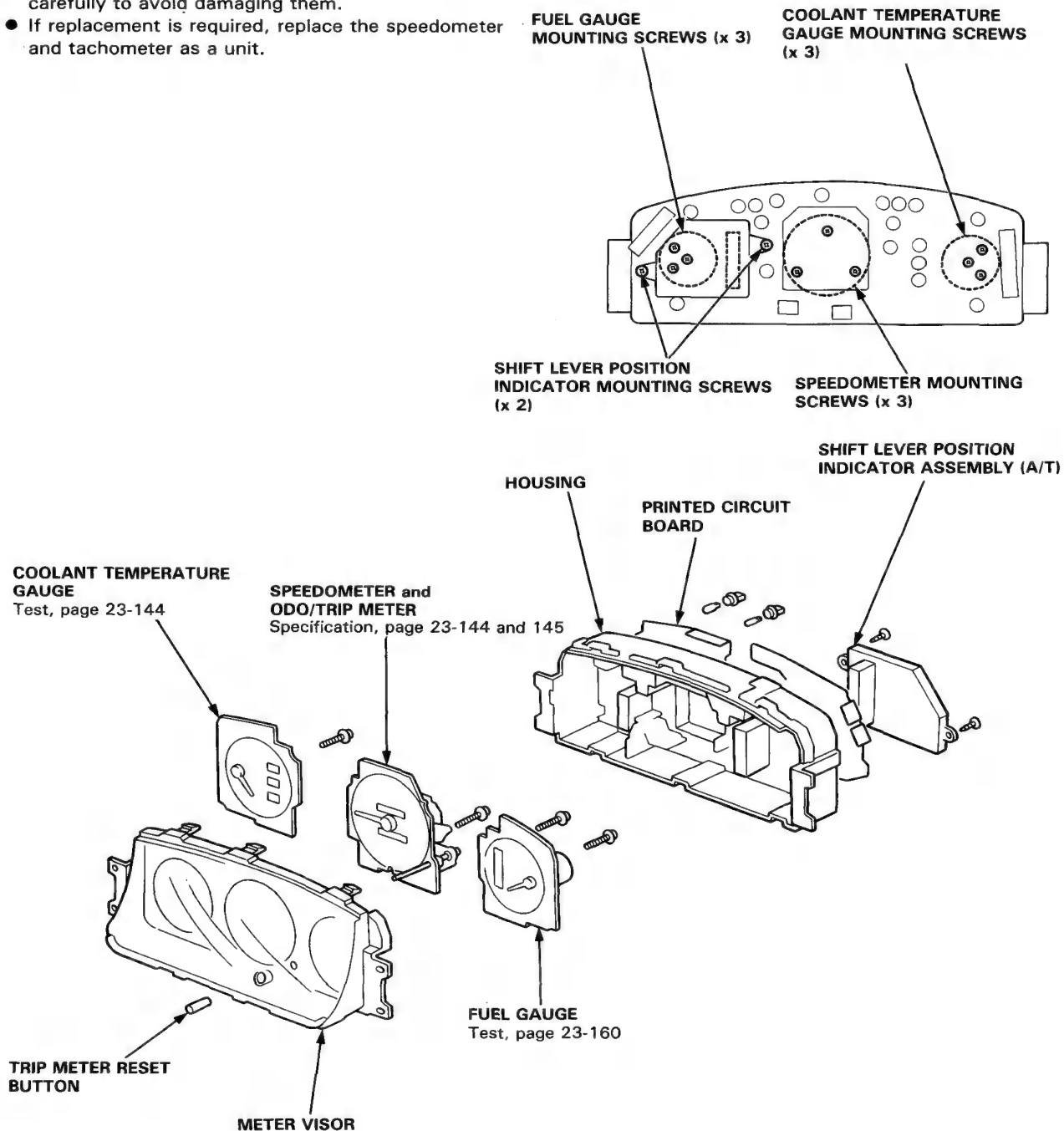
FUEL and COOLANT TEMPERATURE
GAUGE
Test, page 23-160 thru 164



Disassembly (Without Tachometer)

NOTE:

- Handle the terminals and printed circuit boards carefully to avoid damaging them.
- If replacement is required, replace the speedometer and tachometer as a unit.



Speedometer/Trip Meter/Odometer

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected								
Symptom	* 1 (15 A) fuse	Speedometer	Odo/Trip meter	Printed circuit board	Speed sensor input test	Speed sensor is not installed correctly	Poor ground	Open circuit, loose or disconnected terminals
Speedometer operates, but reads wrong.				2		1		
Odo/trip meter operates, but registers wrong.				2		1		
Odometer and trip meter operate, but speedometer does not operate.		1		2				
Speedometer operates, but odometer and trip meter do not operate.			1	2				
Speedometer, odometer and trip meter do not operate.	1			3	2		G201 G401	BLK/YEL YEL/BLU YEL/WHT

Speed Sensor Test

* 1 No. 24 (15 A): With SRS
No. 12 (15 A): Without SRS

Speedometer does not operate.

Inspect * 1 (15 A) fuse in under-dash fuse box before testing.

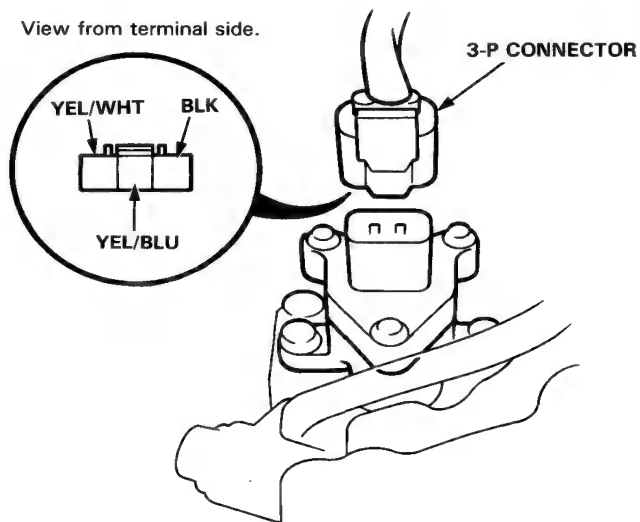
Disconnect 3-P connector at speed sensor.

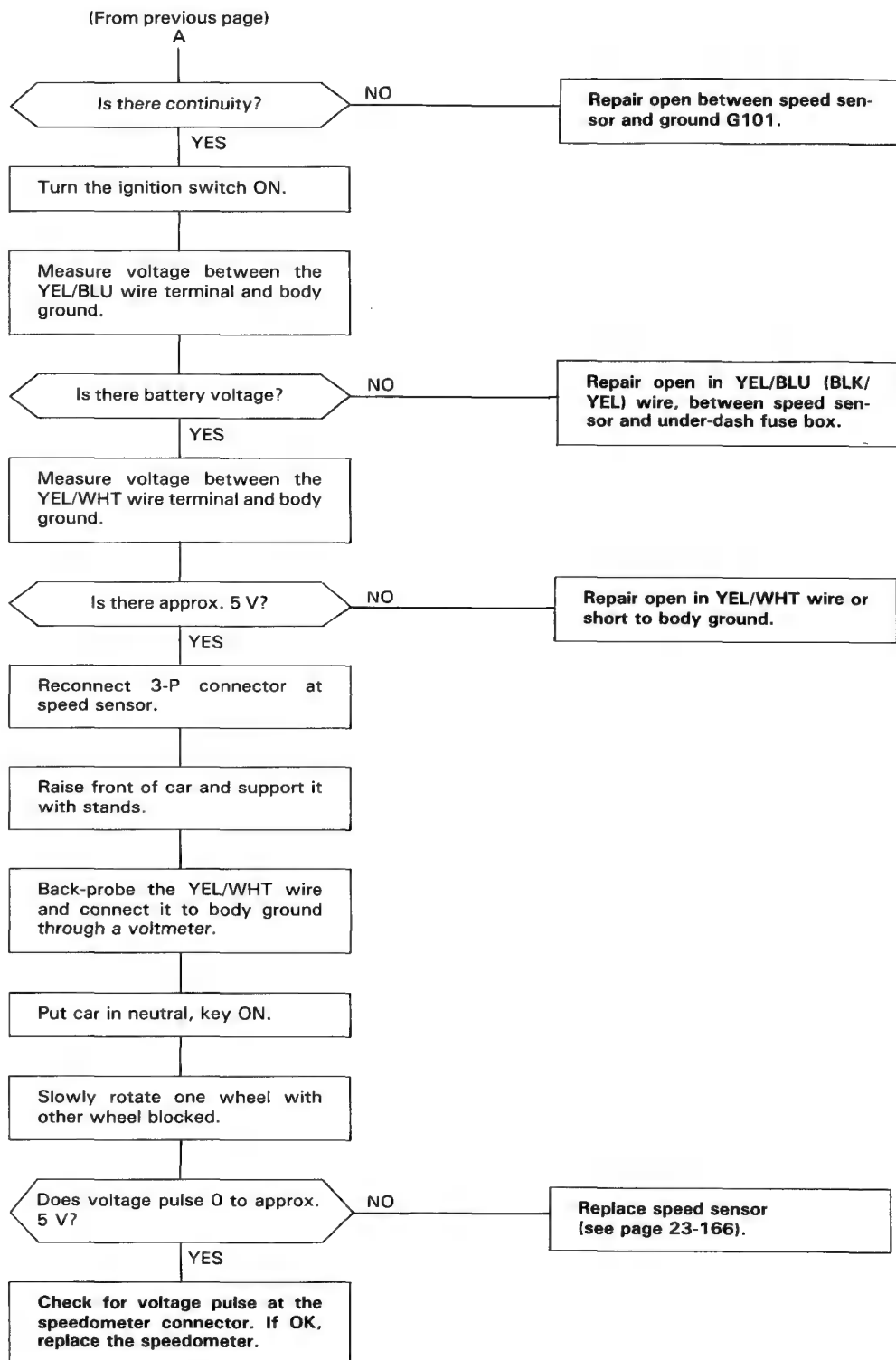
Check for continuity between the BLK wire terminal and body ground.

A

(To next page)

View from terminal side.



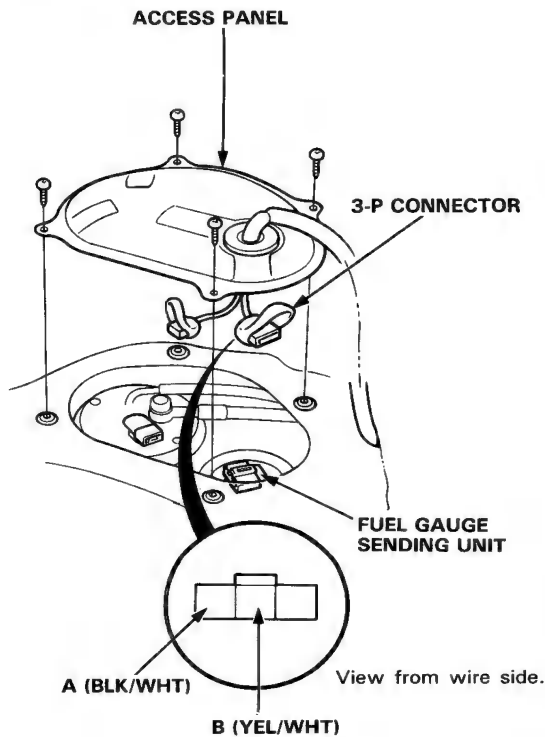


Fuel Gauge

Gauge Test (2WD)

NOTE: Refer to pages 23-147 and 151 for the fuel gauge system circuit.

1. Check the No. 15 (10 A) fuse in the under-dash fuse box before testing.
2. Remove the access panel from the floor.
3. Disconnect the 3-P connector from the fuel gauge sending unit.



4. Connect the voltmeter positive probe to the B (YEL/WHT) terminal and the negative probe to the A (BLK/WHT) terminal, then turn the ignition switch ON.

There should be between 5 and 8 V.

- If the voltage is as specified, go to step 5.
- If the voltage is not as specified, check for:
 - An open in the YEL, YEL/WHT or BLK wire.
 - Poor ground (G551, G552).

5. Turn the ignition switch OFF. Attach a jumper wire between the B (YEL/WHT) and A (BLK/WHT) terminals, then turn the ignition switch ON. Check that the pointer of the fuel gauge starts moving toward the "F" mark.

CAUTION: Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.

NOTE: The fuel gauge is a bobbin (cross-coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves slower than that of a bimetal type.

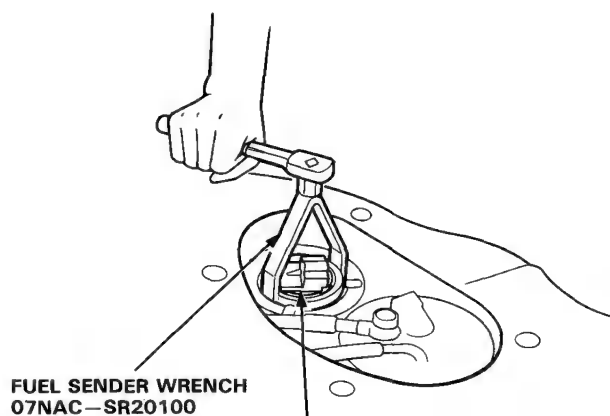
- If the pointer of the fuel gauge does not move at all, replace the gauge.
- If the gauge is OK, inspect the fuel gauge sending unit.



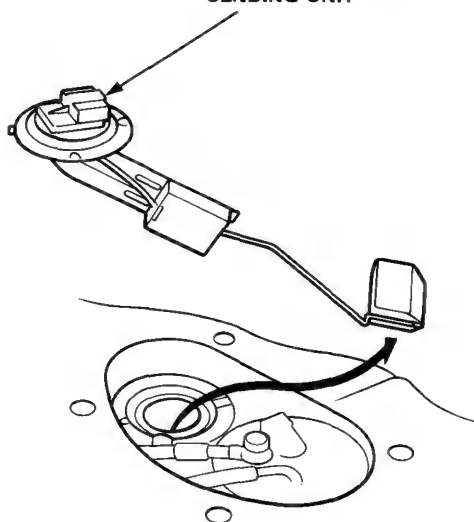
Sending Unit Test (2WD)

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame away from the work area.

1. Remove the access panel from the floor.
2. With the ignition switch OFF, disconnect the 3-P connector from the fuel gauge sending unit.
3. Remove the fuel gauge sending unit.

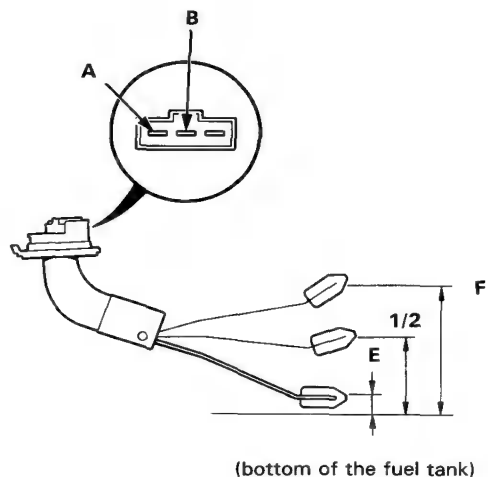


FUEL GAUGE
SENDING UNIT



4. Measure the resistance between the B and A terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

Float Position	E	1/2	F
Length	15 mm (0.59 in)	58 mm (2.28 in)	100 mm (3.94 in)
Resistance (Ω)	105–110	25.5–39.5	2–5



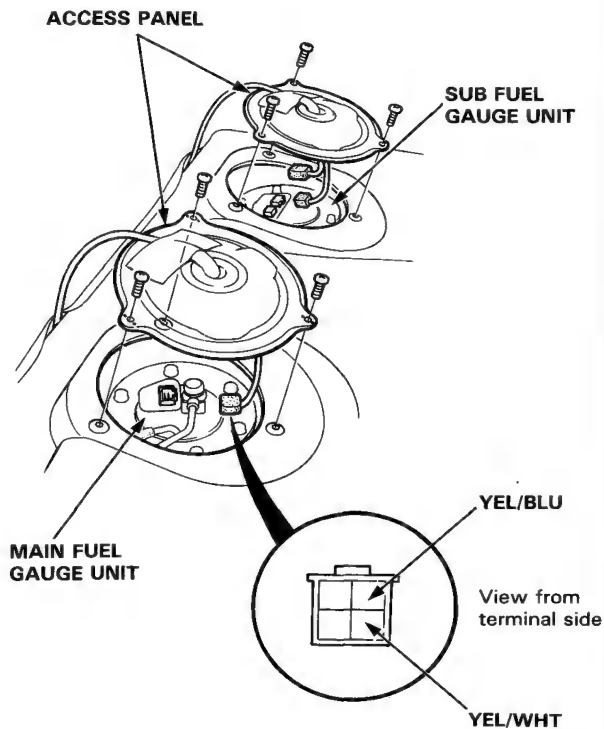
5. If you don't obtain the above readings, replace the fuel gauge sending unit.

Fuel Gauge

Gauge Test (4WD)

NOTE: Refer to page 23-149 for the fuel gauge system circuit.

1. Check the No. 15 (10 A) fuse in the under-dash fuse box before testing.
2. Remove the rear seat (see section 21).
3. Remove the access panels.
4. Disconnect the connectors from the main fuel gauge unit.



5. Connect the voltmeter positive probe to the YEL/WHT terminal and negative probe to the body ground, then turn the ignition switch ON. There should be between 5 and 8 V.
 - If the voltage is as specified, go to step 5.
 - If the voltage is not as specified, check for:
 - An open in the YEL/WHT wire.
 - Fuel gauge assembly.
6. Turn the ignition switch OFF. Attach a jumper wire between the YEL/WHT terminal and body ground.

CAUTION: Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.

NOTE: The fuel gauge is a bobbin (cross coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves slower than that of a bimetal type.

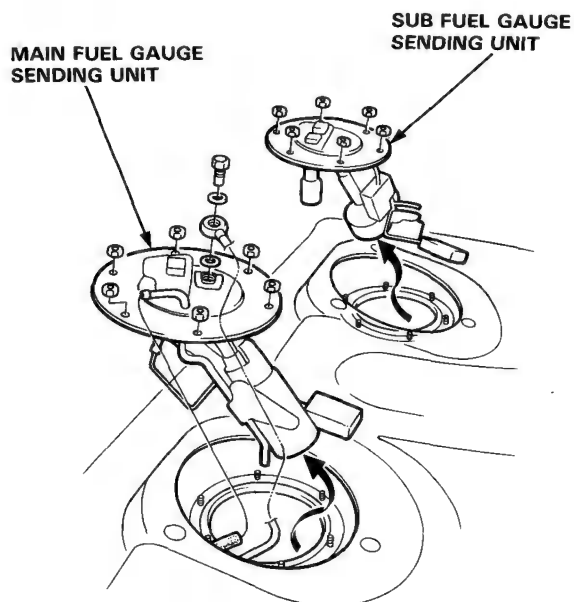
- If the pointer of the fuel gauge does not move at all, replace the gauge.
- If the gauge is OK, check for:
 - Main/sub fuel sendint unit.
 - An open in the YEL/BLU wire.
 - Poor ground (G551, G552).



Sending Units Test (4WD)

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame away from the work area.

1. Remove the rear seat (see Section 21).
2. Remove the access panels.
3. With the ignition switch OFF, disconnect the connectors from the fuel gauge units.
4. Remove the 6 nuts, then pull out the fuel gauge sending units from the fuel tank.

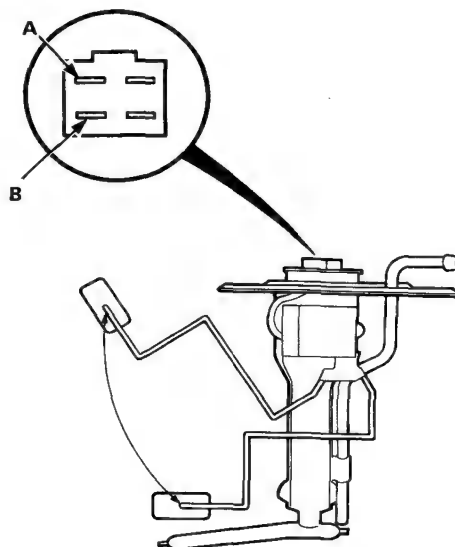


5. Check that the floats move up and down freely.

6. Measure the resistance between the A and B terminals at E (EMPTY) and F (FULL) by moving the float.

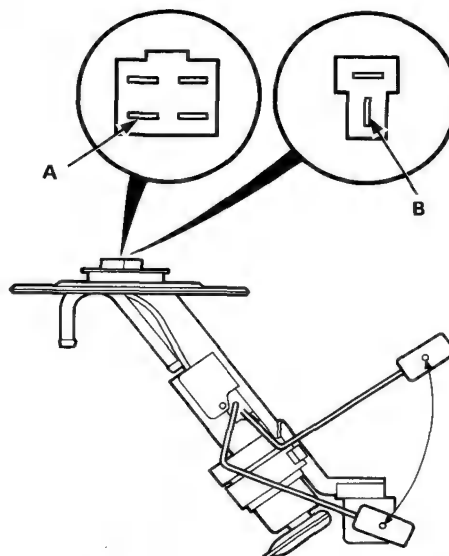
Main Fuel Sending Unit:

Float Position	E	F
Resistance Ω	0—3	57.4—61.4



Sub Fuel Sending Unit:

Float Position	E	F
Resistance Ω	0—2	34.6—37.6



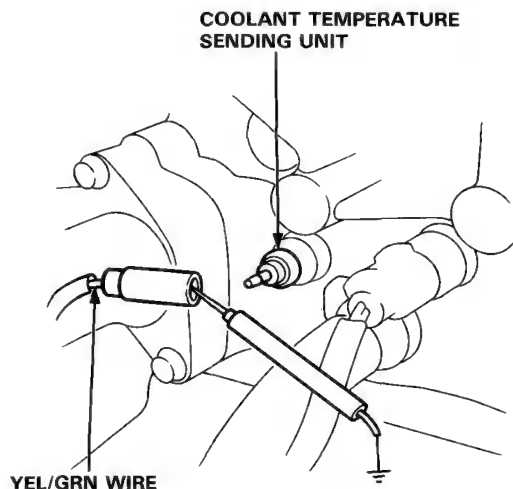
7. If unable to obtain the above readings, replace the fuel gauge sending unit.

Coolant Temperature Gauge

Gauge Test

NOTE: Refer to pages 23-147, 149, and 151 for the wiring description of the coolant temperature gauge circuit diagram.

1. Check the No. 15 (10 A) fuse in the under-dash fuse box before testing.
2. Make sure the ignition switch is OFF, then disconnect the YEL/GRN wire from the temperature gauge sending unit and ground it with a jumper wire.



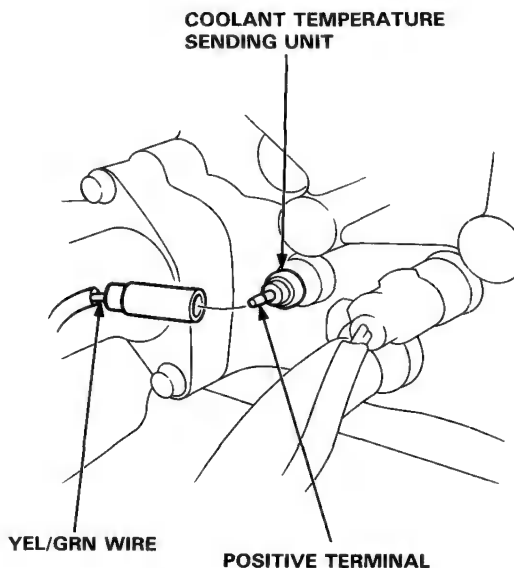
3. Turn the ignition switch ON. Check that the pointer of the temperature gauge starts moving toward the "H" mark.

CAUTION: Turn the ignition switch OFF before the pointer reaches "H" on the gauge dial. Failure to do so may damage the gauge.

- If the pointer of the gauge does not move at all, check for:
 - An open in the YEL or YEL/GRN wire.If the wires are OK, replace the coolant temperature gauge.
- If the gauge works, inspect the sending unit.

Sending Unit Test

1. Disconnect the YEL/GRN wire from the sender.
2. With the engine cold, use an ohmmeter to measure resistance between the positive terminal and the engine (ground).



3. Check the temperature of the coolant.
4. Run the engine and measure the change in resistance with the engine at operating temperature (cooling fan comes on).

Temperature	56°C (133°F) (Engine cold)	85°C (185°F)— 100°C (212°F)
Resistance (Ω)	142	49—32

5. If the obtained readings are substantially different from the specifications above, replace the sending unit.

Low Fuel Indicator



Indicator Light Test

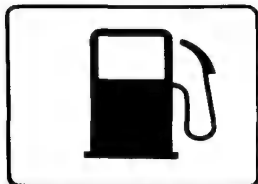
NOTE: Refer to page 23-147 for the wiring description of the low fuel indicator circuit.

1. Park car on level ground.

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame away from the work area.

Drain fuel only into an approved container.

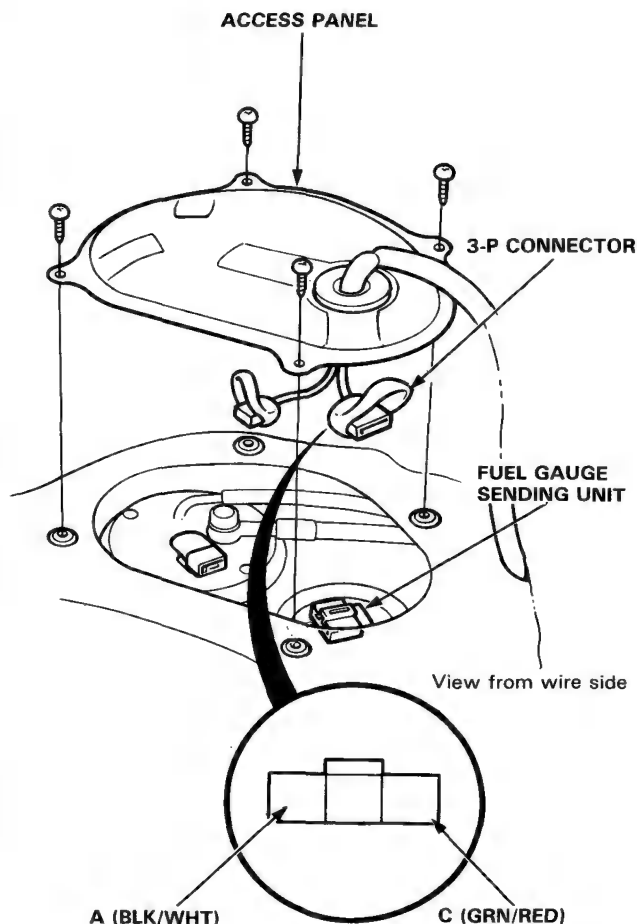
2. Drain fuel tank into an approved container. Then install the drain bolt with a new washer.
3. Add less than 6.5 ℓ (1.7 U.S. Gal, 1.4 Imp. Gal) of fuel and turn the ignition switch on. The low fuel indicator light should come on within 4 minutes.



FUEL INDICATOR LIGHT (in the gauge assembly)

4. Then add approx. 4 ℓ (1.1 U.S. Gal, 0.9 Imp. Gal) of fuel.

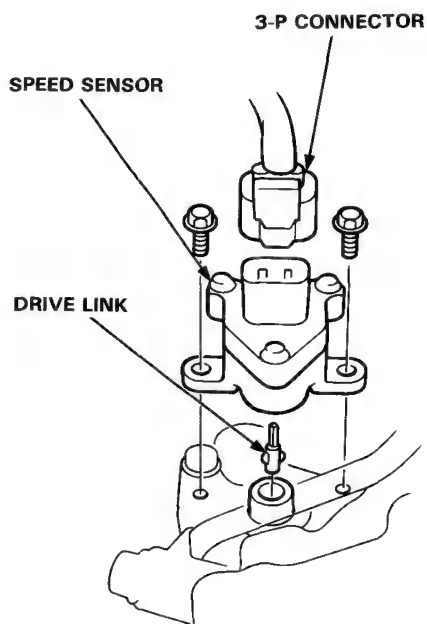
- The light should go out within 4 minutes.
- If the light did not come on in step 3, remove the access panel and disconnect the 3-P connector from the fuel gauge sending unit. Connect the A (BLK/WHT) terminal to the C (GRN/RED) terminal with a jumper wire.
 - If the light comes on, the problem is either the sending unit or its ground.
 - If the light does not come on, the problem is an open in the GRN/RED wire to the gauge assembly, or no power to the gauge, or a bad bulb.



Speed Sensor

Replacement

1. Disconnect the 3-P connector from the speed sensor.
2. Remove the mounting bolts, then remove the speed sensor.



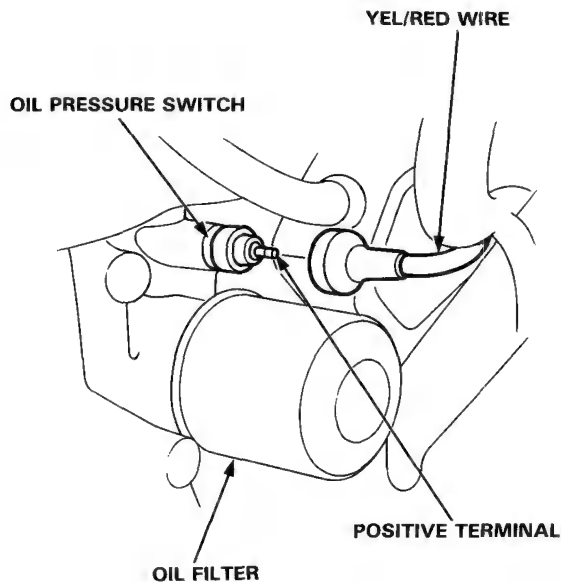
3. Install in the reverse order of removal.

NOTE: The speed sensor drive link is a very small part; be careful not to lose it.

Oil Pressure Warning System

Oil Pressure Switch Test

1. Remove the YEL/RED wire from the oil pressure switch.



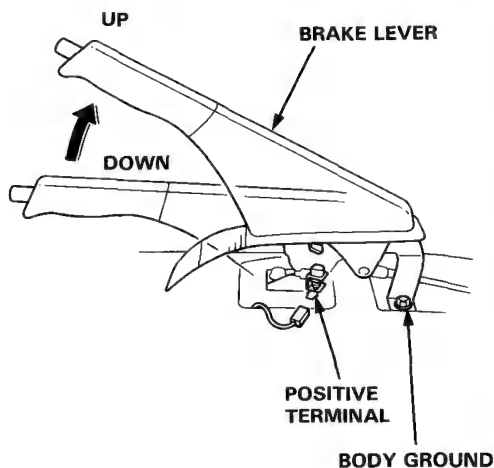
2. There should be continuity between the positive terminal and the engine (ground) with the engine stopped. There should be no continuity when the engine runs.
3. If the switch fails to operate, check the engine oil level. If the oil level is correct, check oil pump pressure (see Section 8).

Brake Warning System



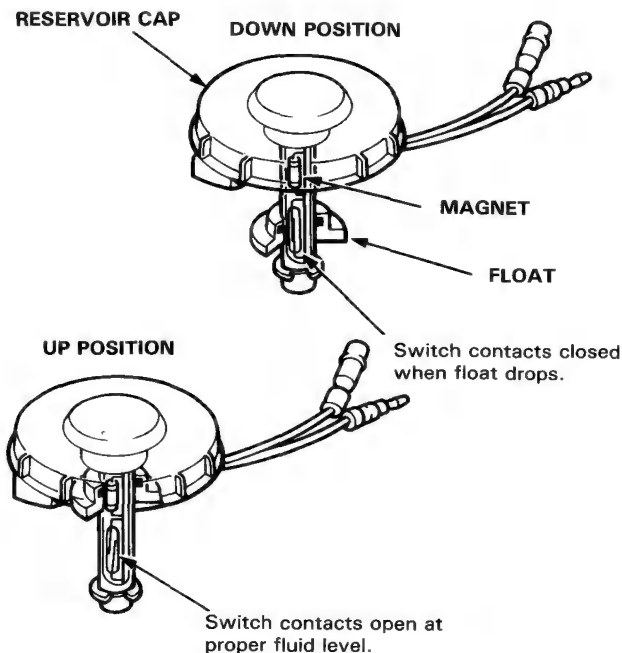
Parking Brake Switch Test

1. Remove the floor console and disconnect the connector from the switch.
2. There should be continuity between the positive terminal and body ground with the brake lever up. There should be no continuity with the brake lever down.



Brake Fluid Level Switch Test

1. Remove the reservoir cap. Check that the float moves up and down freely. Replace the reservoir cap assembly if the float does not move freely.
2. Check for continuity between the terminals with the float up and down. There should be continuity with the float down and no continuity with the float up. Replace the reservoir cap assembly if necessary.



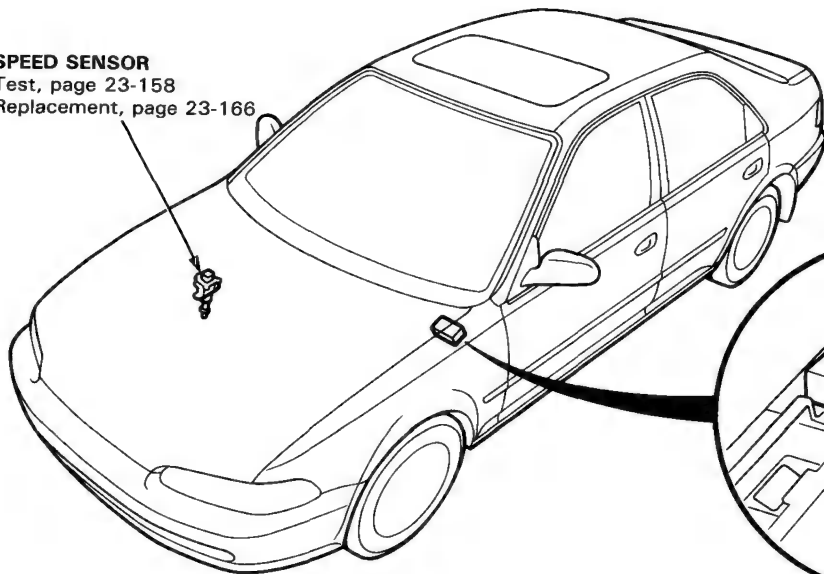
Speed Alarm System (KY)

Component Location Index

SPEED SENSOR

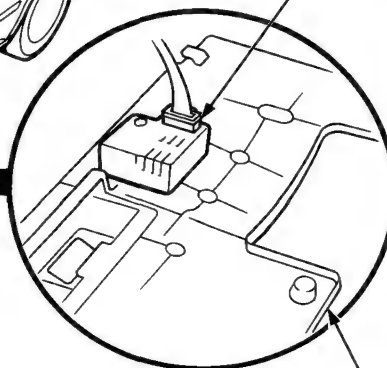
Test, page 23-158

Replacement, page 23-166



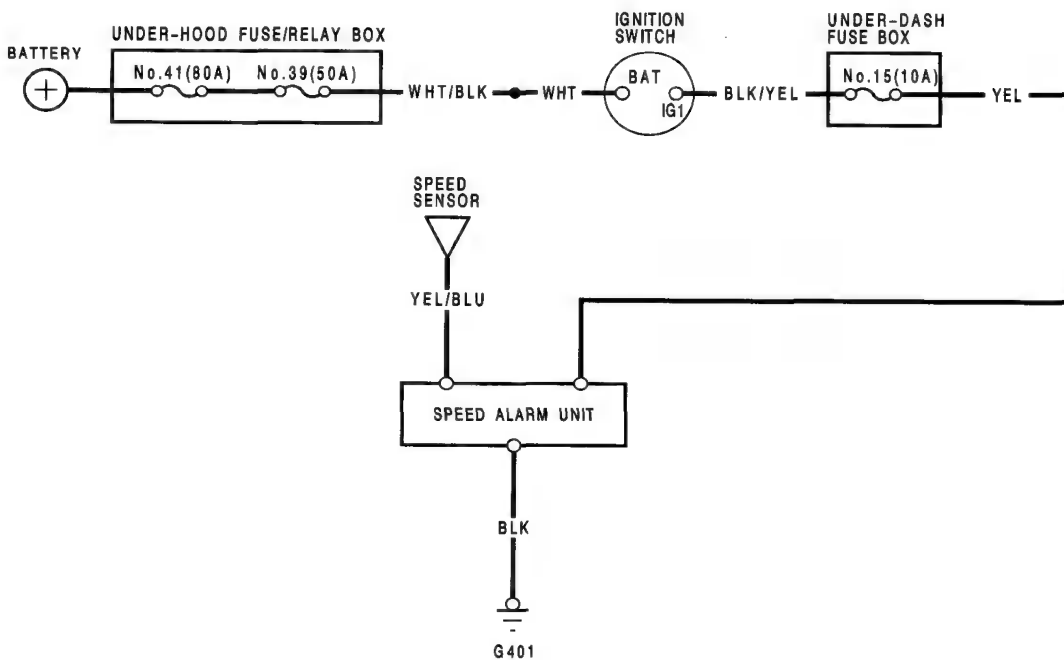
SPEED ALARM UNIT

Test, page 23-169



DASHBOARD LOWER COVER

Circuit Diagram



Speed Alarm System (KY)

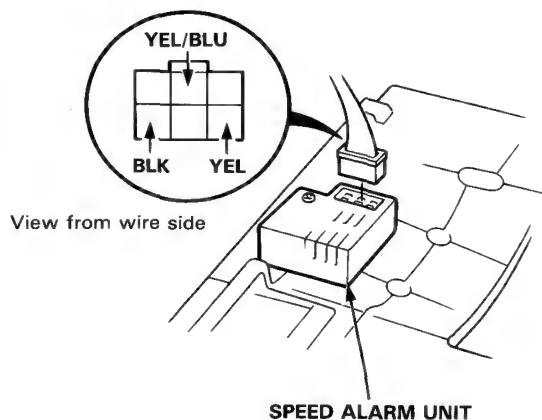


Speed Alarm Unit Test

NOTE: Before testing, check the No. 15 (10 A) fuse in the under-dash fuse box.

1. Remove the dashboard lower cover, then disconnect the 6-P connector from the speed alarm unit.

NOTE: The speed alarm unit is located behind the dashboard lower cover.



2. Check for continuity between the BLK terminal and body ground.
There should be continuity.
 - If there is no continuity, check for:
 - An open in the BLK wire.
 - Poor ground (G401).
3. Check for voltage between the YEL terminal and body ground with the ignition switch ON.
There should be battery voltage.
 - If there is no voltage, check for an open in the YEL wire.
 - If there is battery voltage, go to step 4.

4. With the ignition switch OFF, reconnect the 6-P connector to the speed alarm unit, and connect the voltmeter to the YEL/BLU terminal.
5. Raise the car and place safety stands in the proper locations (see section 1).
6. Turn the ignition switch on again and rotate the front wheel slowly, then check if the voltmeter indicator moves alternately from 0 V to 5 V and from 5 V to 0 V.
 - If there is no voltage, check for:
 - Defective speed sensor (see page 23-158).
 - An open in the YEL/BLU wire.
7. Replace the speed alarm unit if the speed sensor is not faulty.

Interlock System

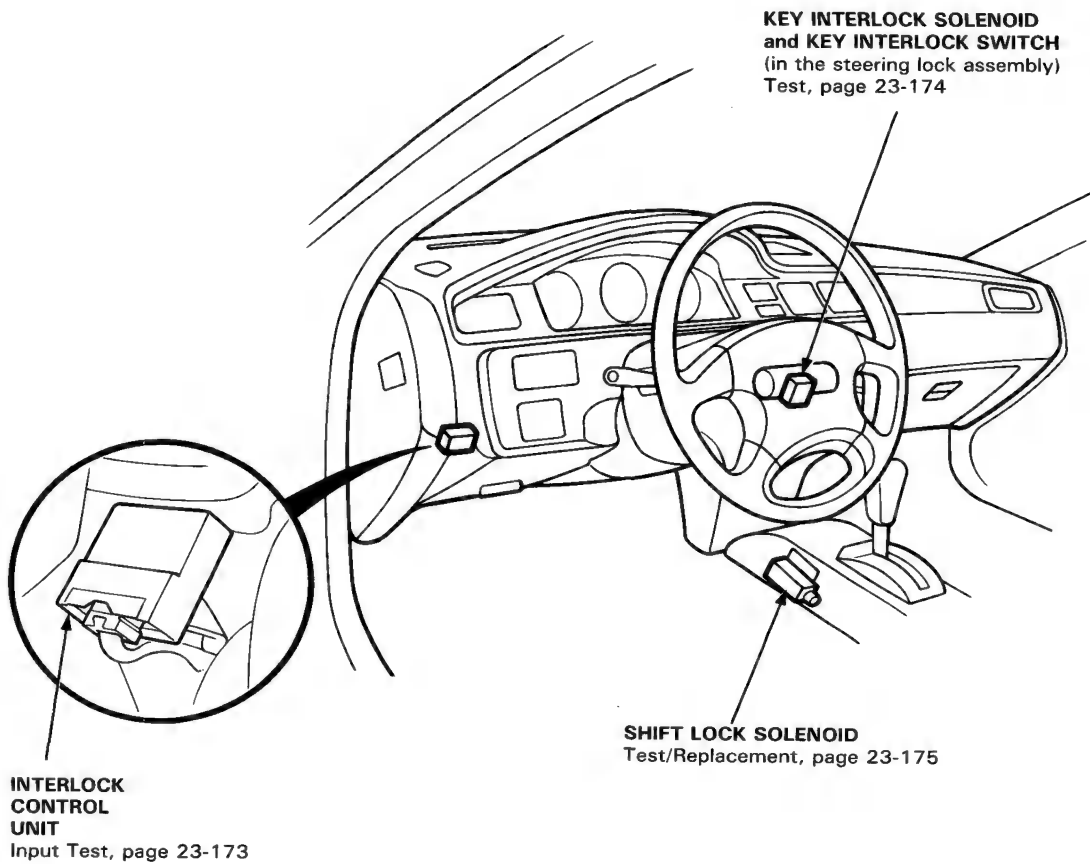
Component Location Index

SHIFT LEVER POSITION INDICATOR

See page 23-176

SHIFT POSITION CONSOLE SWITCH

Test, page 23-182



Interlock System



Description

The car is equipped with the following devices to prevent inadvertent shifting:

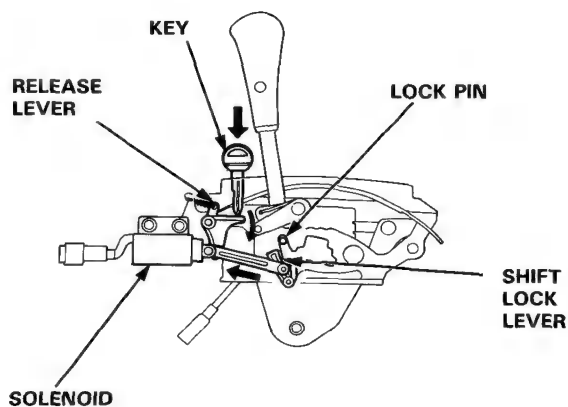
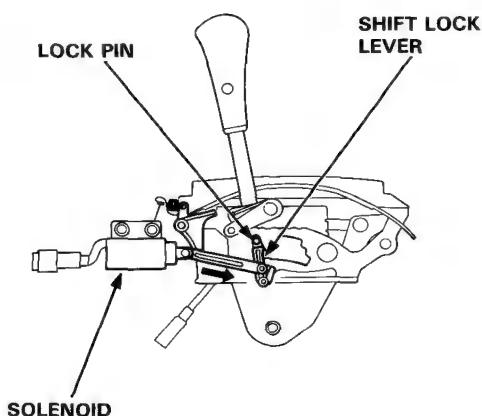
- A/T selector with shift lock
- Key cylinder with interlocked ignition key

Shift Lock System:

The shift lock system prevents the shift lever from moving to "R" or "D4" from the "P" position unless the brake pedal is depressed and the accelerator is in its rest position.

NOTE:

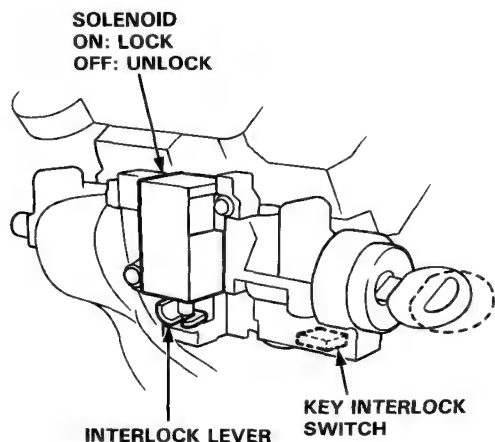
- The shift lever cannot be shifted when the brake pedal and the accelerator are stepped on at the same time.
- In case of system malfunction, the shift lever can be released by pushing a key into the release slot near the shift lever.



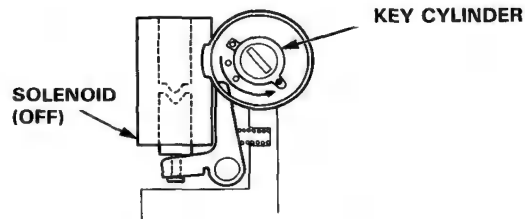
Key Interlock System:

The ignition key cannot be removed from the ignition switch unless the shift lever is in the "P" position.

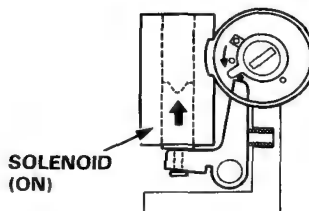
If the key is inserted when the shift lever is in any position other than "P", a solenoid is activated, making it impossible for the key to be removed until the shift lever is moved to the "P" position.



The shift lever is in the "P" position.

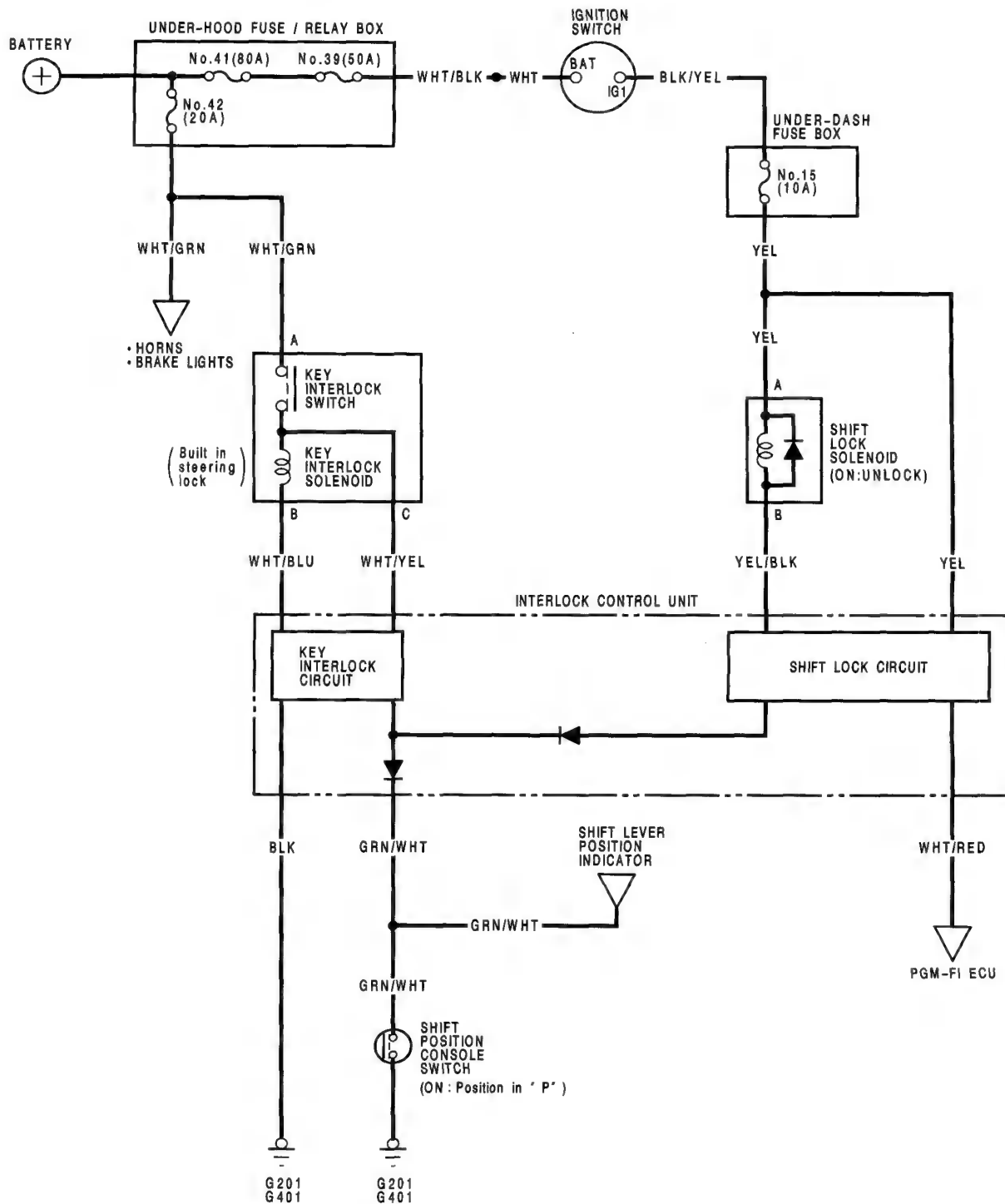


The shift lever is in any position except "P".



Interlock System

Circuit Diagram

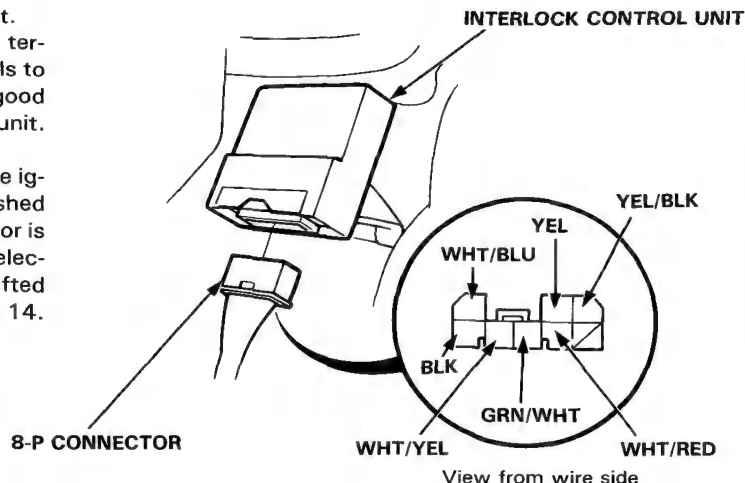




Control Unit Input Test

Disconnect the 8-P connector from the control unit. Make the following input tests at the connector terminals. If all tests prove OK, yet the system still fails to work, substitute the control unit with a known-good one. If the system is then OK, replace the control unit.

NOTE: If the shift lock solenoid clicks when the ignition switch is ON and the brake pedal is pushed (the shift lever is in position P and the accelerator is in its rest position), the shift lock system is electronically normal. If the shift lever cannot be shifted from position P, see page 23-182 and section 14.



Shift Lock System:

No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	YEL	Ignition switch ON.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
2	WHT/RED	Ignition switch ON. Step on the brake pedal and the accelerator at the same time.	Check for voltage to ground: it should be 5 V or less.	<ul style="list-style-type: none"> • Faulty ECU. • An open in the wire.
3	GRN/WHT	Shift lever in position P.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty shift position console switch. • Poor ground. • An open in the wire.
4	YEL/BLK	Ignition switch ON.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • Faulty shift lock solenoid. • An open in the wire.

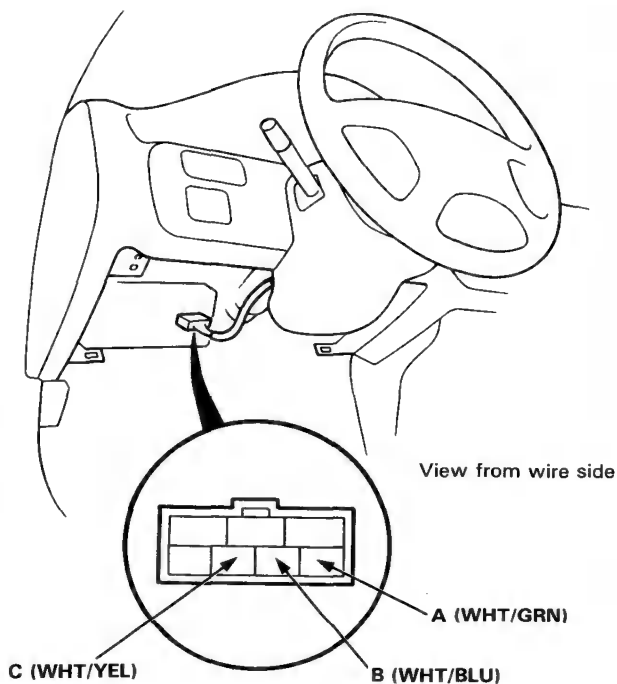
Key Interlock System:

No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	GRN/WHT	Shift lever in position P.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty shift position console switch. • Poor ground. • An open in the wire.
3	WHT/YEL	Ignition switch turned to ACC and the key pushed in.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 42 (20 A) fuse. • Faulty steering lock assembly (key interlock solenoid). • An open in the wire.
4	WHT/BLU	Ignition switch turned to ACC and the key pushed in.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 42 (20 A) fuse. • Faulty steering lock assembly (key interlock solenoid). • An open in the wire.

Interlock System

Key Interlock Solenoid Test

1. Remove the dashboard lower cover.
2. Remove the knee bolster (see Section 20).
3. Disconnect the 7-P connector from the main wire harness.



4. Check for continuity between the terminals in each switch position according to the table.

Terminal		A	B	C
Position				
Ignition switch ACC	Key pushed in.	○	○	○
	Key released.*		○	○

*: 15–20 ohms

5. Check that the key cannot be removed when the battery is connected to the A and B terminals.
 - If the key cannot be removed, the key interlock solenoid is OK.
 - If the key can be removed, replace the steering lock assembly (key interlock solenoid is not available separately).

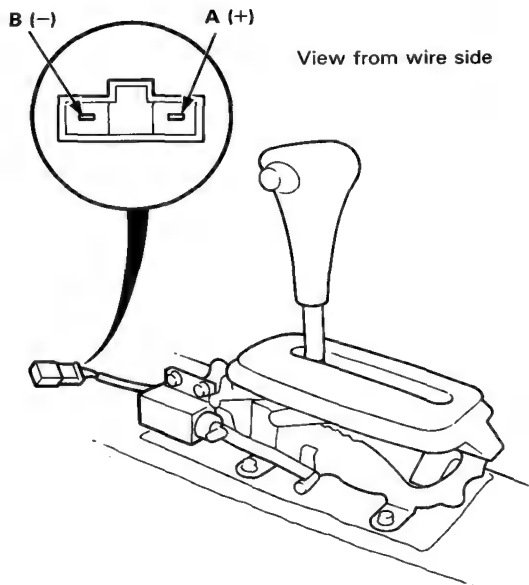


Shift Lock Solenoid Test/Replacement

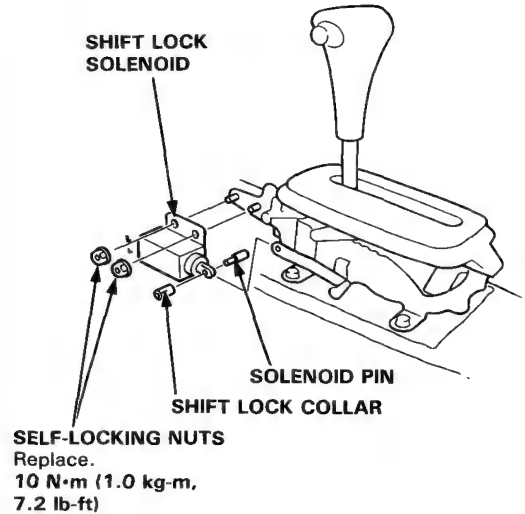
1. Remove the console, then disconnect the 3-P connector of the shift lock solenoid from the main wire harness.

NOTE: Do not connect power to the B (-) terminal (reverse polarity) or you will damage the diode inside the solenoid.

2. Connect battery power to the A terminal, ground the B terminal momentarily, and check solenoid operation.



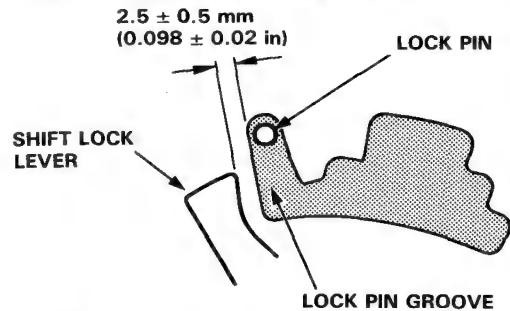
- If the solenoid does not operate, replace it as described in steps 3, 4, and 5.
 - If the solenoid does operate, check and, if necessary, adjust its two positions as shown in step 5.
3. Remove the shift lock collar and the solenoid pin.
 4. Remove the self-locking nuts and shift lock solenoid, then install the new solenoid in the reverse order of removal.



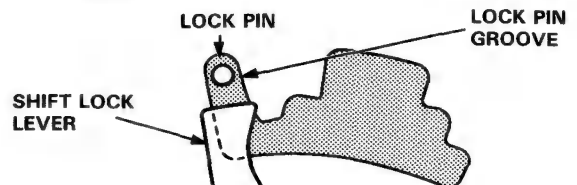
5. Check and, if necessary, adjust the solenoid's position.

- When the shift lock solenoid is ON, check that there is a clearance of 2.5 ± 0.5 mm (0.098 ± 0.02 in.) between the top of the shift lock lever and the lock pin groove, then tighten the self-locking nuts.

NOTE: Use new self-locking nuts.



- When the shift lock solenoid is OFF, make sure that the lock pin is blocked by the shift lock lever.



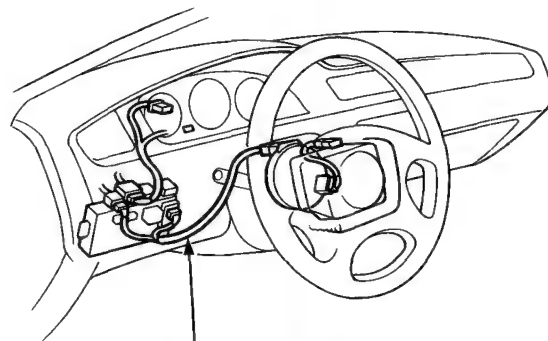
NOTE: Test for solenoid operation after installation is complete.

Shift Lever Position Indicator

Component Location Index

CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

GAUGE ASSEMBLY

Removal, page 23-152

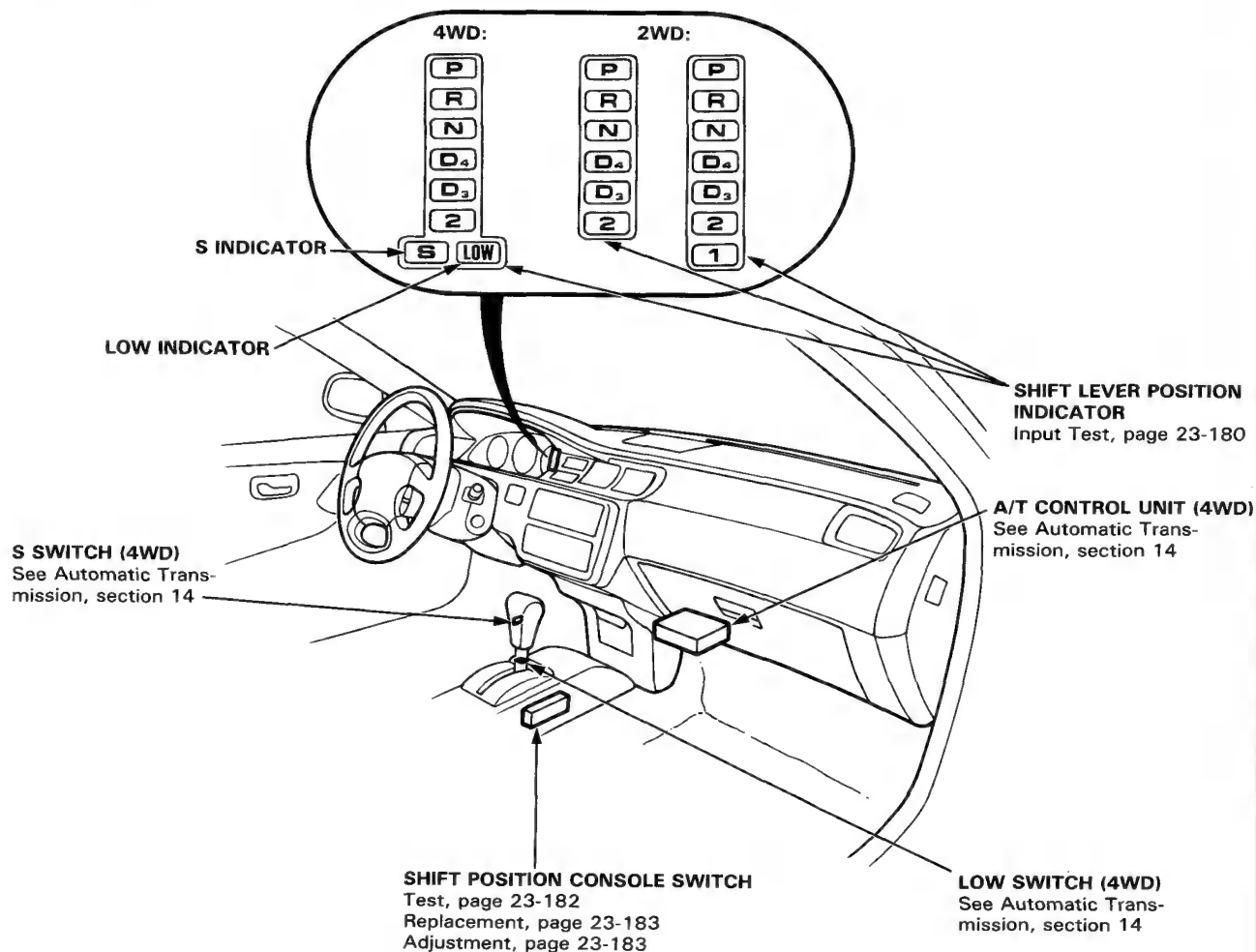
Disassembly, page 23-156 and 157

A/T CONTROL SYSTEM

See Automatic Transmission section 14

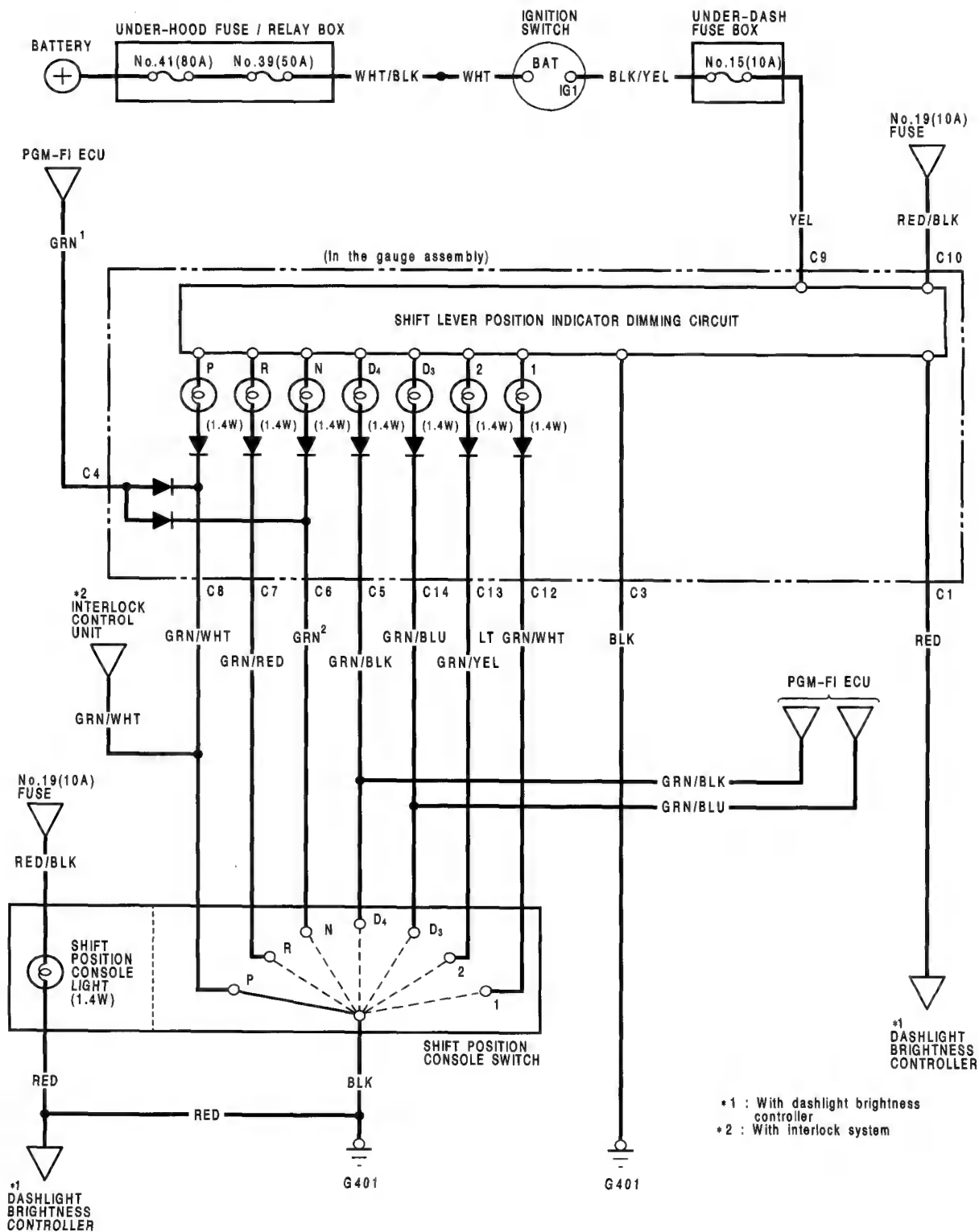
INTERLOCK SYSTEM

See page, 23-170



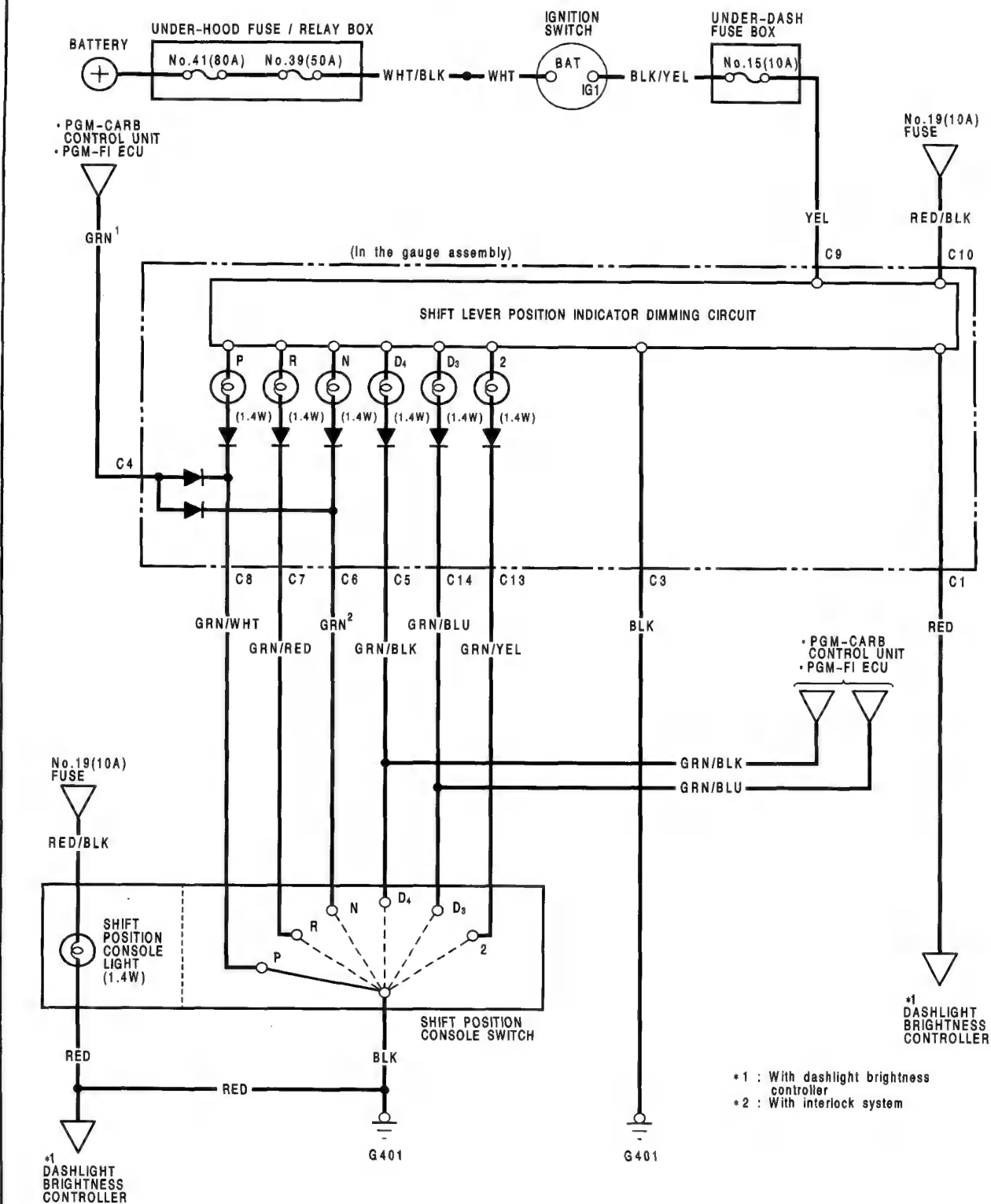
Shift Lever Position Indicator

Circuit Diagram (2WD: 7-Position Indicator)



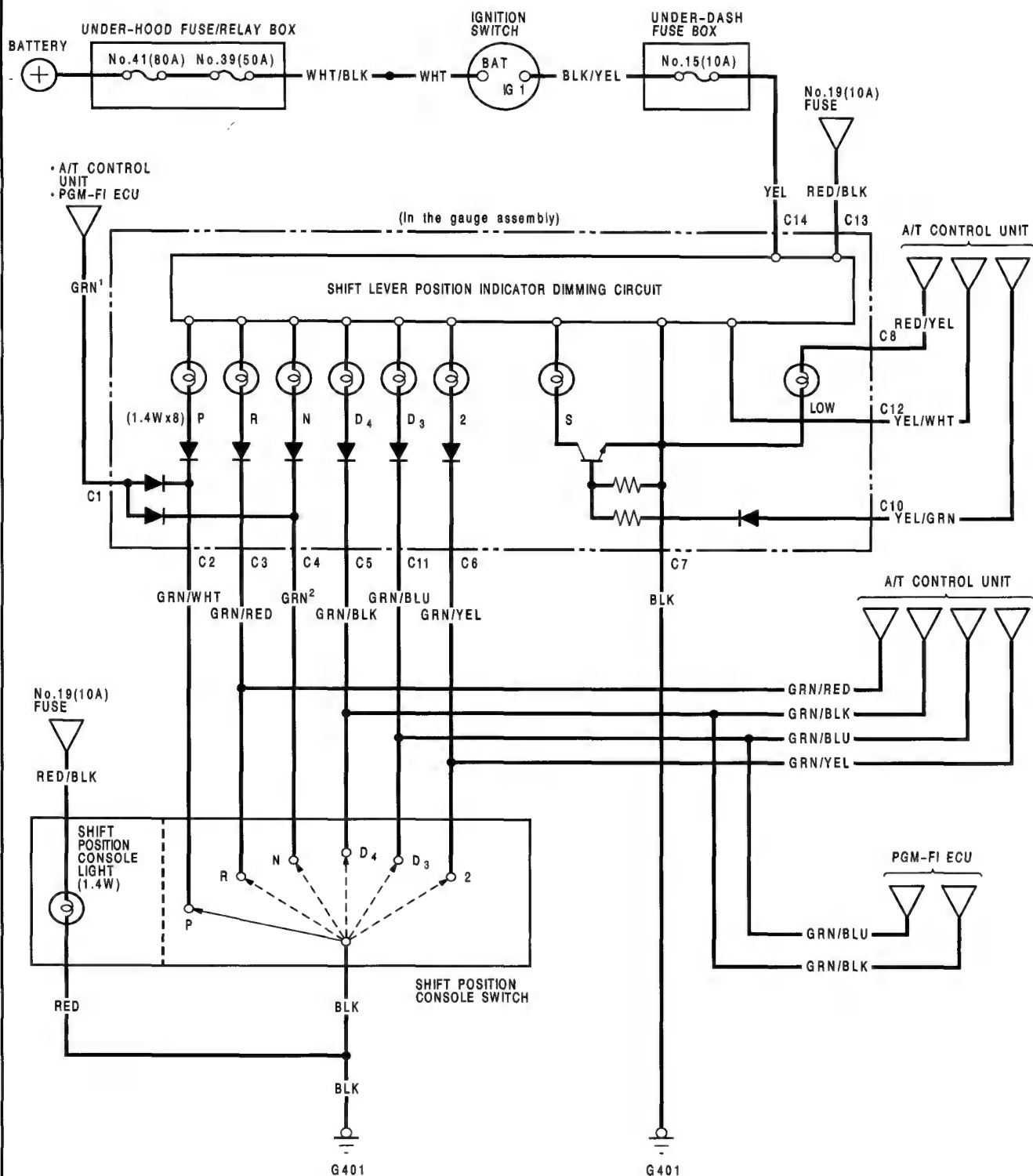
Shift Lever Position Indicator

Circuit Diagram (2WD: 6-Position Indicator)





Circuit Diagram (4WD)



Shift Lever Position Indicator

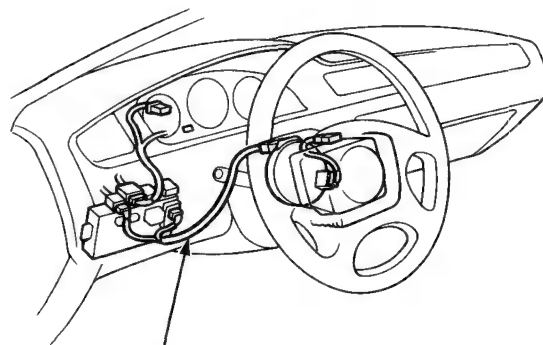
Indicator Input Test

CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

Remove the gauge assembly from the dashboard (see page 23-152), and disconnect the 14-P connector from it. Make the following input tests at the connector terminals. If all tests prove OK, yet the indicator still fails to work, replace the gauge assembly.

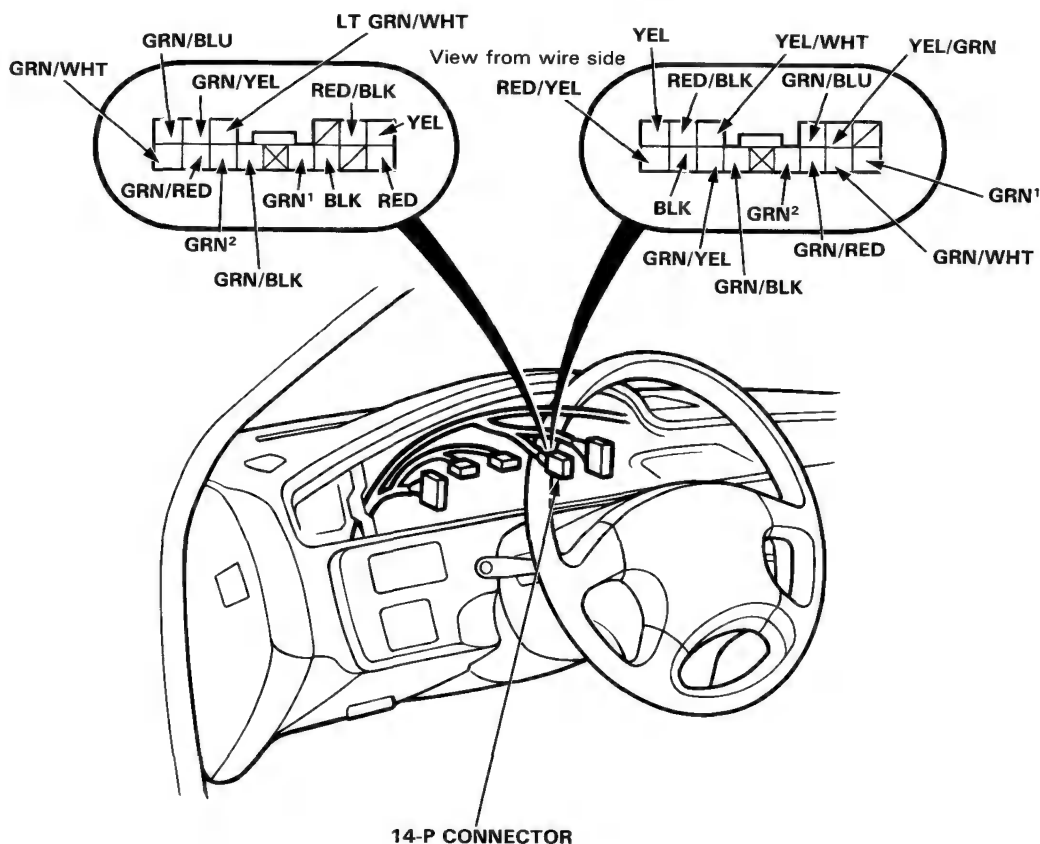
NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example GRN¹ and GRN² are not the same).



SRS MAIN HARNESS

2WD:

4WD:





2WD:

No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	YEL	Ignition switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
3	GRN/WHT	Shift lever in position P.	Check for continuity to ground: there should be continuity. NOTE: There should be no continuity in any other position.	<ul style="list-style-type: none"> • Faulty shift position console switch. • Poor ground (G401). • An open in the wire.
	GRN/RED	Shift lever in position R.		
	GRN ²	Shift lever in position N.		
	GRN/BLU	Shift lever in position D ₃ .		
	GRN/BLK	Shift lever in position D ₄ .		
	GRN/YEL	Shift lever in position 2.		
	LT-GRN/WHT	Shift lever in position 1.		
4	RED/BLK and RED	Comb. light switch ON and dashlight brightness control dial on full bright.	Check for voltage between RED/BLK and RED terminals: there should be battery voltage.	<ul style="list-style-type: none"> • Faulty dashlight brightness control system. • An open in the wire.
5	GRN ¹	Ignition switch ON.	Check for voltage to ground: there should be more than 5 V.	<ul style="list-style-type: none"> • Faulty PGM-FI ECU. • Faulty PGM-CARB control unit. • An open in the wire.

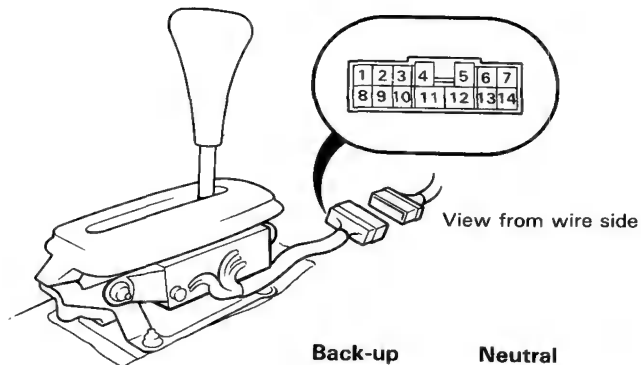
4WD:

No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	YEL	Ignition switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
3	GRN/WHT	Shift lever in position P.	Check for continuity to ground: there should be continuity. NOTE: There should be no continuity in any other position.	<ul style="list-style-type: none"> • Faulty shift position console switch. • Poor ground (G401). • An open in the wire.
	GRN/RED	Shift lever in position R.		
	GRN ²	Shift lever in position N.		
	GRN/BLU	Shift lever in position D ₃ .		
	GRN/BLK	Shift lever in position D ₄ .		
	GRN/YEL	Shift lever in position 2.		
4	RED/BLK	Comb. light switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (10 A) fuse. • An open in the wire.
5	YEL/GRN	Ignition switch ON, shift lever in position D ₃ or D ₄ and S switch ON.	Check for voltage to ground: there should be more than 5 V.	<ul style="list-style-type: none"> • Faulty S switch. • Faulty shift position console switch. • Faulty A/T control unit. • An open in the wire.
6	RED/YEL	Ignition switch ON, shift lever in position 2 and LOW switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Faulty LOW switch. • Faulty shift position console switch. • Faulty A/T control unit. • An open in the wire.
7	GRN ¹	Ignition switch ON.	Check for voltage to ground: there should be more than 5 V.	<ul style="list-style-type: none"> • Faulty PGM-FI ECU. • An open in the wire.
8	YEL/WHT	Ignition switch ON, shift lever in position D ₃ or D ₄ and S switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Faulty S switch. • Faulty shift position console switch. • Faulty A/T control unit. • An open in the wire.

Shift Lever Position Indicator

Shift Position Console Switch Test

1. Remove the console, then disconnect the 14-P connector from the console switch.
2. Check for continuity between the terminals in each position according to the table.
 - Move the lever back and forth at each position without touching the push button, and check for continuity within the range of free play.
 - If there is no continuity within the range of free play, adjust the installed position of the console switch.



Shift Position Switch (With cruise control)

Back-up
Light Switch Neutral
Safety Switch

Terminal Position	13	7	6	3	2	1	8	9	10	4	5	11	12
1		○	○										
2	○	○		○									
D ₃	○	○			○								
D ₄	○	○				○							
N		○					○					○	○
R		○						○		○	○		
P		○							○			○	○

Shift Position Switch (Without cruise control)

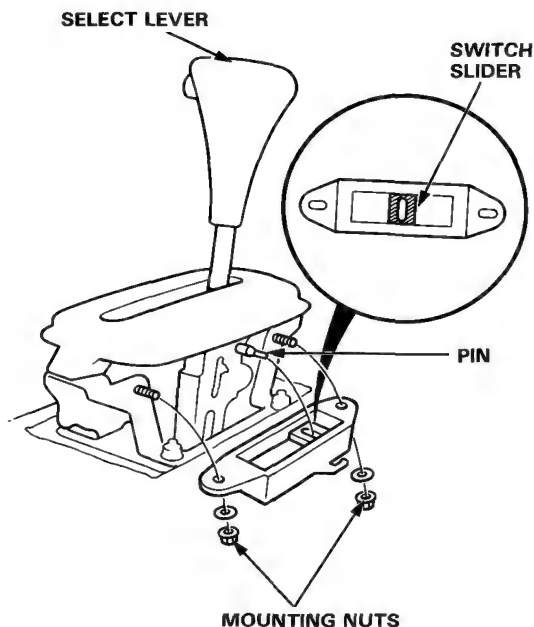
Back-up
Light Switch Neutral
Safety Switch

Terminal Position	7	6	3	2	1	8	9	10	4	5	11	12
1	○	○										
2	○		○									
D ₃	○			○								
D ₄	○				○							
N	○					○					○	○
R	○						○		○	○		
P	○							○			○	○



Shift Position Console Switch Replacement

1. Remove the console, then disconnect the 14-P connector from the console switch.
2. Remove the 2 console switch mounting nuts.



3. Position the switch slider to "Neutral" as shown above.
4. Shift the select lever to "Neutral", then slip the console switch into position.
5. Attach the switch with the 2 nuts.
6. Test the console switch in the P and N positions of the shift lever.

NOTE: The engine should start when the shift lever is in position N anywhere in the range of free play.

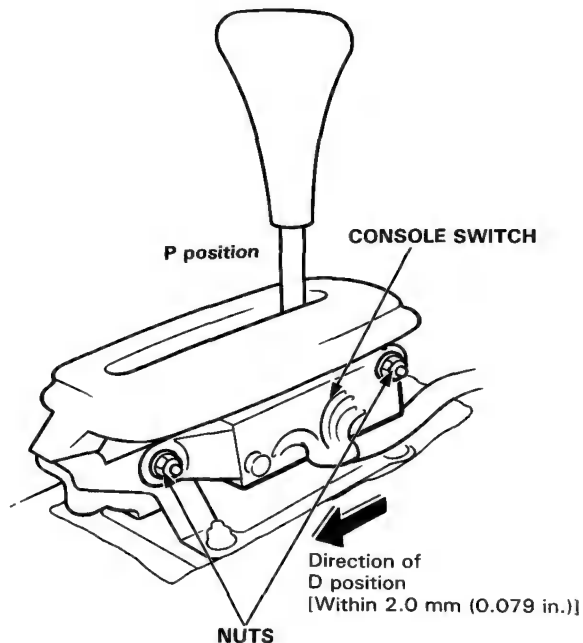
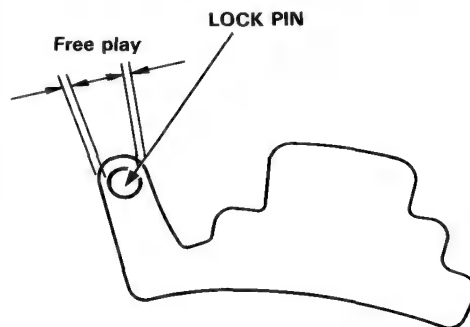
7. Connect the 14-P connector, clamp the harness and install the console.

Shift Position Console Switch Adjustment

1. Shift to the "P" position, and loosen the nuts.
2. Slide the switch in the direction of D position [within 2.0 mm (0.079 in.)] so that there is continuity between No. 7 and No. 10 terminals in the range of free play of the shift lever.
3. Recheck for continuity between each of the terminals.

NOTE:

- If adjustment is not possible, check for damage to the shift lever detent and/or the bracket. If there is no damage, replace the console switch.
- The engine should start when the shift lever is in position N in the range of free play.

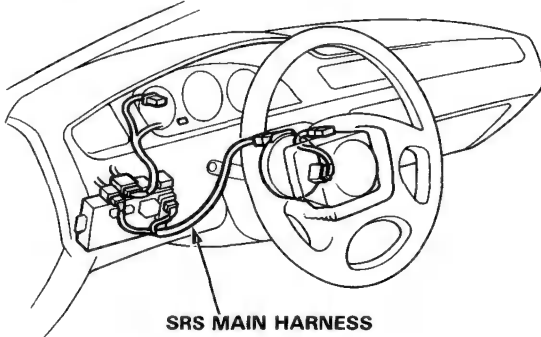


Shift Lever Position Indicator

Bulb Replacement

CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



1. Remove the gauge assembly (see page 23-152).
2. Disassemble the gauge assembly (see page 23-156).

3. Remove the bulb.
4. Install in the reverse order of removal.

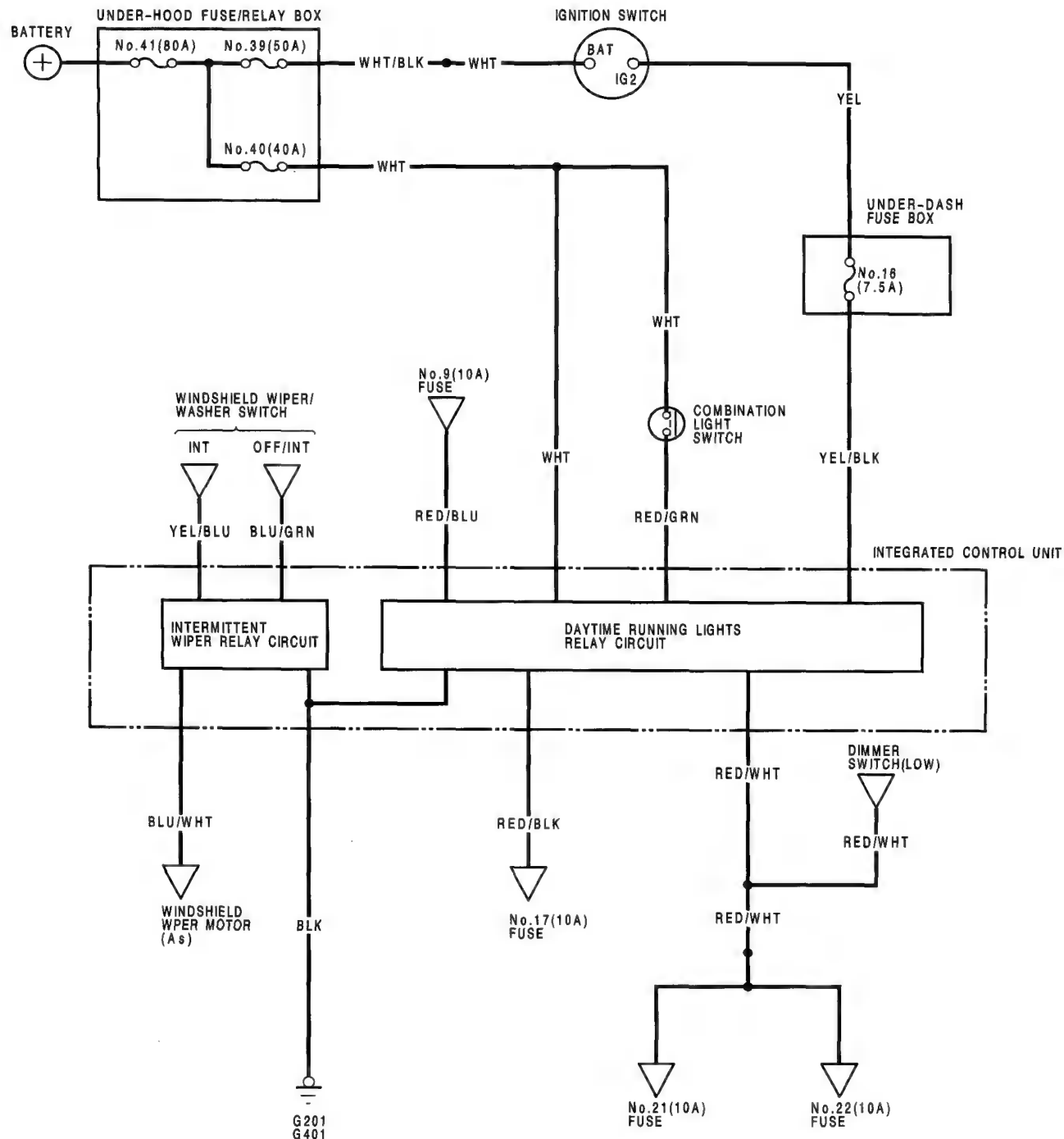
Integrated Control Unit



Circuit Diagram (With Daytime Running Lights)

Description

An integrated control unit, located behind the dashboard lower cover, integrates the functions of the daytime running lights relay circuit and the intermittent wiper circuit onto one circuit board, sharing common circuit functions.



Integrated Control Unit

Input Test (With Daytime Running Lights)

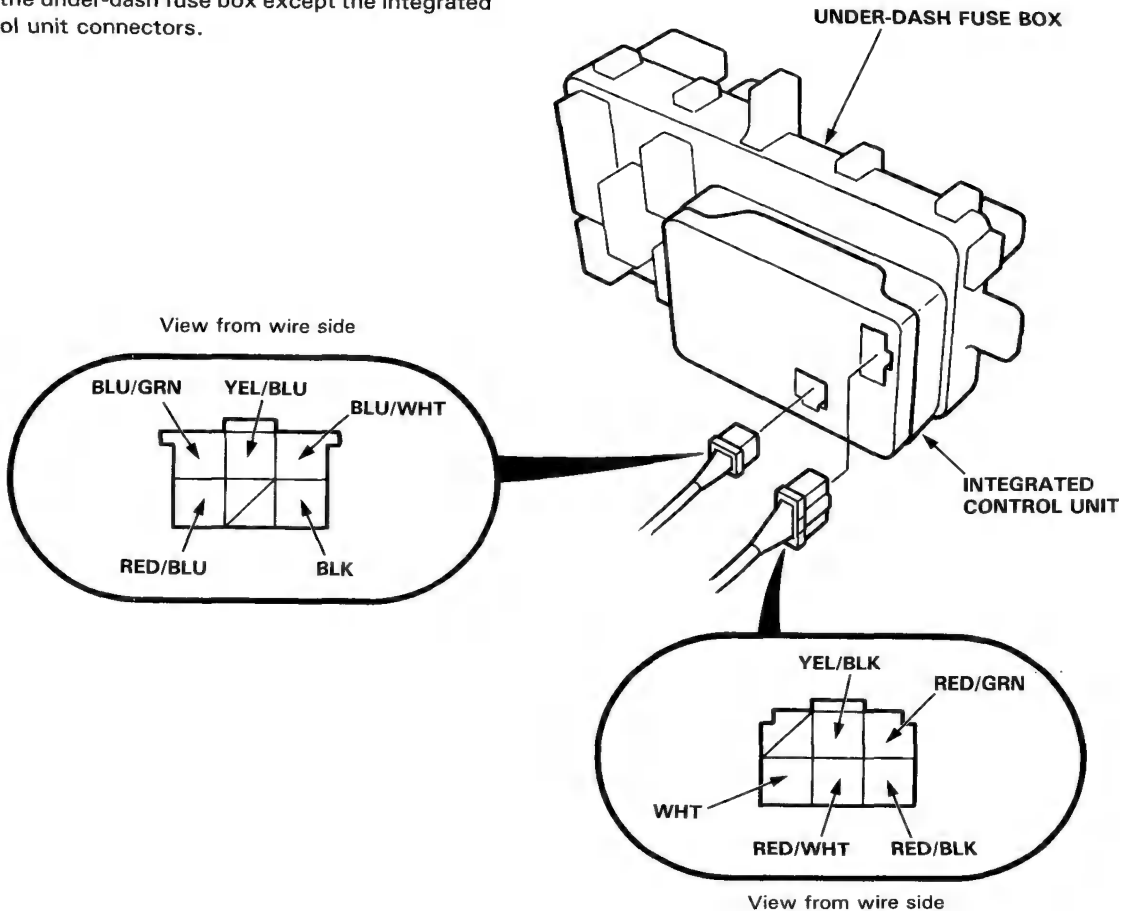
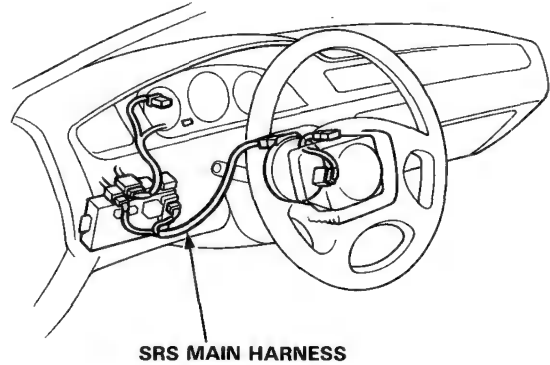
CAUTION (with SRS):

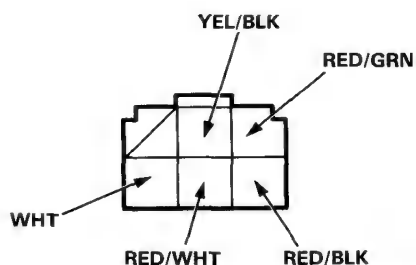
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

Remove the dashboard lower cover, then disconnect the 6-P connectors from the integrated control unit.

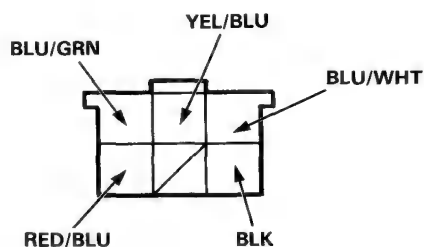
Make the following input tests at the connector terminals. If all tests prove OK, yet the system still fails to work, replace the control unit.

NOTE: Do not disconnect any other connectors from the under-dash fuse box except the integrated control unit connectors.





View from wire side.



View from wire side.

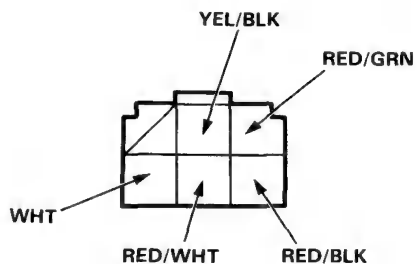
Daytime Running Lights Relay System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	WHT	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 40 (40 A) fuse. • An open in the wire.
3	YEL/BLK	Ignition switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 16 (7.5 A) fuse. • An open in the wire.
4	RED/GRN	Headlight switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 40 (40 A) fuse. • Faulty headlight switch. • An open in the wire.
5	RED/BLU	Headlight switch to ON, and dimmer switch to "HI".	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 9 (10 A) fuse. • Faulty headlight switch. • An open in the wire.
6	RED/BLK	Connect a jumper wire between the WHT and RED/BLK terminals.	Front parking lights, taillights, and license plate lights should come on.	<ul style="list-style-type: none"> • Blown No. 17 (10 A) fuse. • Faulty front parking lights, taillights or license plate lights. • An open in the wire.
7	RED/WHT	Connect a jumper wire between the WHT and RED/WHT terminals.	Left and right headlight (LOW) should come on.	<ul style="list-style-type: none"> • Blown No. 21 and 22 (10 A) fuse. • Blown bulbs. • An open in the wire.

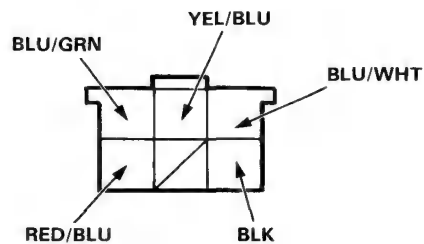
(cont'd)

Integrated Control Unit

Input Test (With Daytime Running Lights) (cont'd)



View from wire side



View from wire side

Intermittent Wiper Relay System:

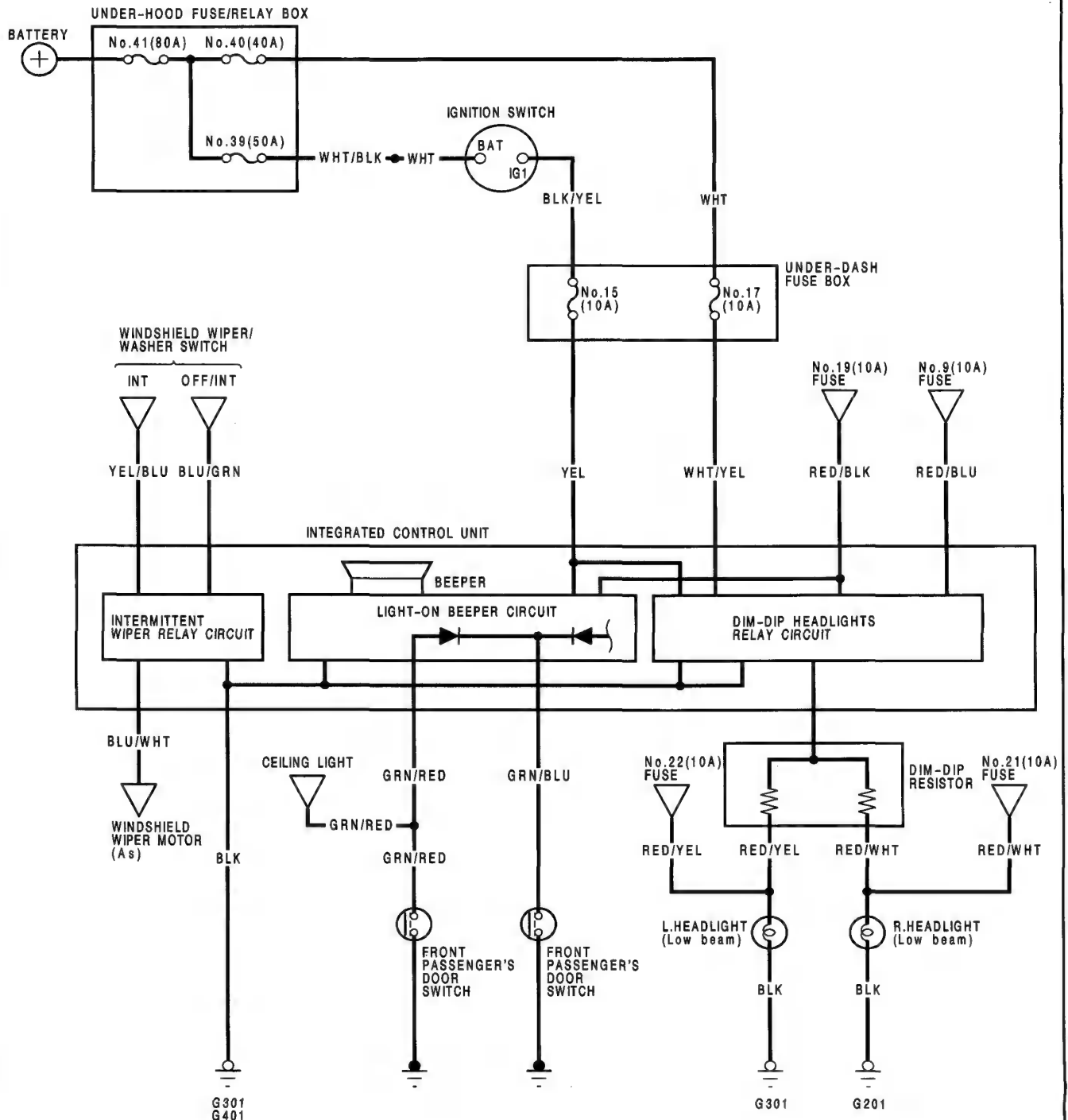
No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	YEL/BLU	Ignition switch to ON, and windshield wiper switch INT.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A) fuse. • Faulty windshield wiper switch. • An open in the wire.
3	BLU/WHT and BLU/GRN	Windshield wiper switch OFF or INT, and wiper blades in park position.	Check for continuity between the BLU/WHT and BLU/GRN terminals: there should be continuity.	<ul style="list-style-type: none"> • Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
4	BLK/GRN	Ignition switch to ON, and windshield washer motor switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A) fuse. • Faulty windshield wiper switch. • An open in the wire.



Circuit Diagram (With Dim-Dip Headlights)

Description

An integrated control unit, located behind the dashboard lower cover, integrates the functions of the dim-dip headlights relay circuit, light-on beeper circuit, and the intermittent wiper circuit onto one circuit board, sharing common circuit functions.



Integrated Control Unit

Input Test (With Dim-Dip Headlights)

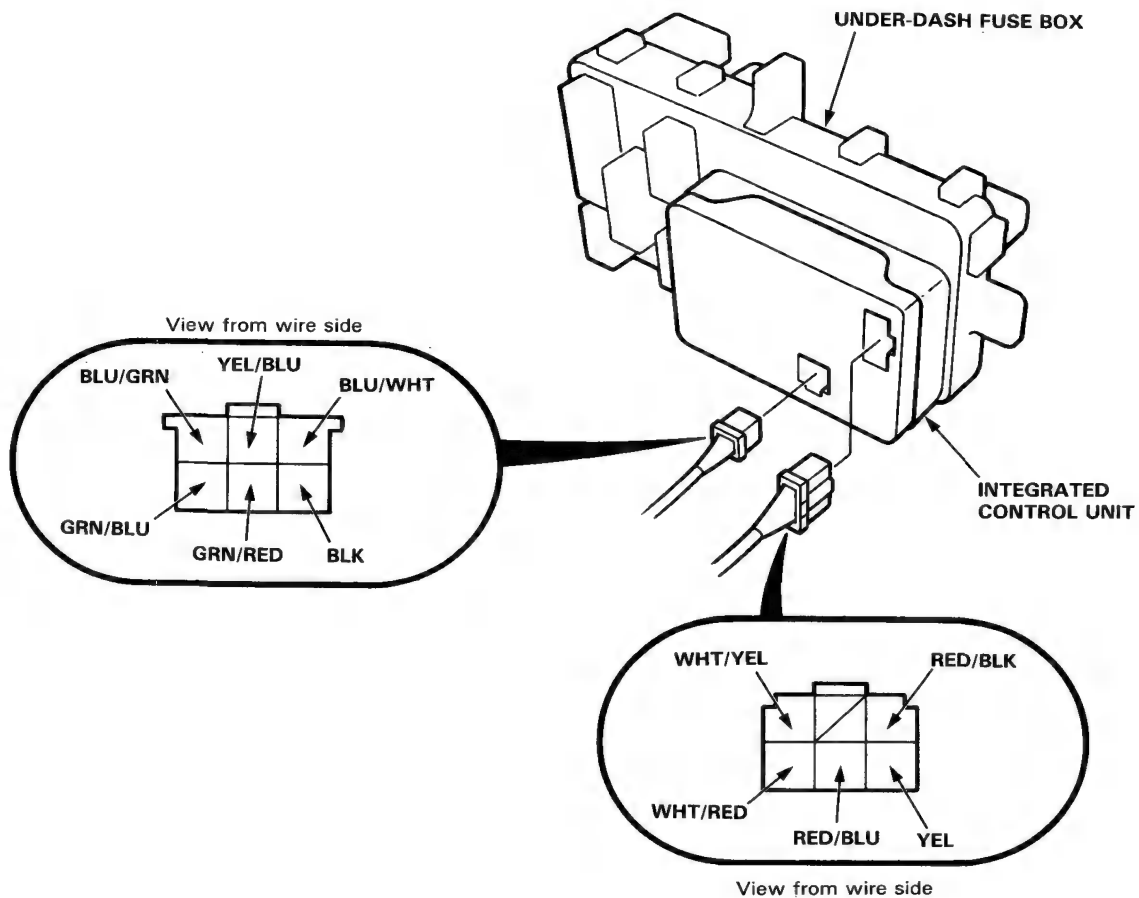
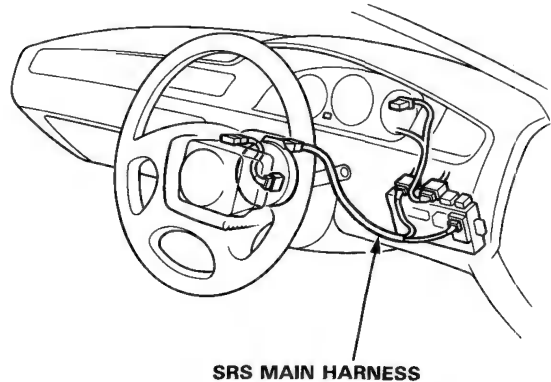
CAUTION (with SRS):

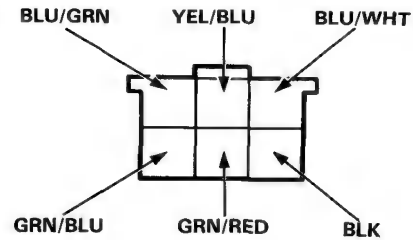
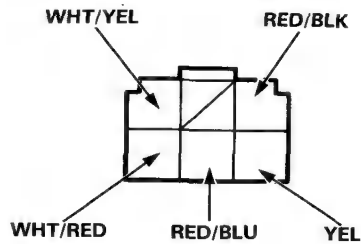
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wire harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

Remove the dashboard lower cover, then disconnect the 6-P connectors from the integrated control unit.

Make the following input tests at the connector terminals. If all tests prove OK, yet the system still fails to work, replace the control unit.

NOTE: Do not disconnect any other connectors from the under-dash fuse box except the integrated control unit connectors.





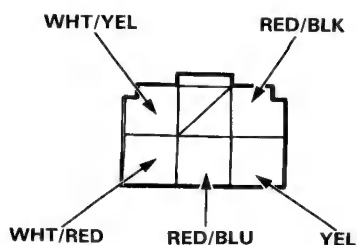
Dim-Dip Headlights Relay System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G301). • An open in the wire.
2	WHT/YEL	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 17 (10 A) fuse. • An open in the wire.
3	YEL	Ignition switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
4	RED/BLK	Headlight switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (10 A) fuse. • Faulty headlight switch. • An open in the wire.
5	RED/BLU	Headlight switch to ON, and dimmer switch to "HI".	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 9 (10 A) fuse. • Faulty headlight switch. • An open in the wire.
6	WHT/RED	Connect a jumper wire between the WHT/YEL and WHT/RED terminals.	Left and right headlight (LOW) should be dim light.	<ul style="list-style-type: none"> • Poor ground (G201, G301). • Blown bulbs. • Faulty dim-dip resistor. • An open in the wire.

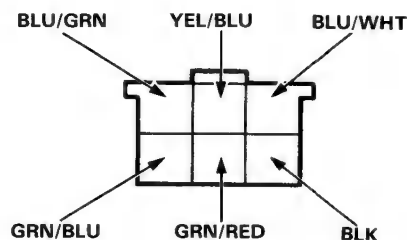
(cont'd)

Integrated Control Unit

Input Test (With Dim-Dip Headlights) (cont'd)



View from wire side



View from wire side

Light-on Beeper System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G301). • An open in the wire.
2	WHT/YEL	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 17 (10 A) fuse. • An open in the wire.
3	YEL	Ignition switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
4	GRN/BLU	Driver's door switch opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door switch. • An open in the wire.
5	GRN/RED	Front passenger's door opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty front passenger's door switch. • An open in the wire.

Intermittent Wiper Relay System:

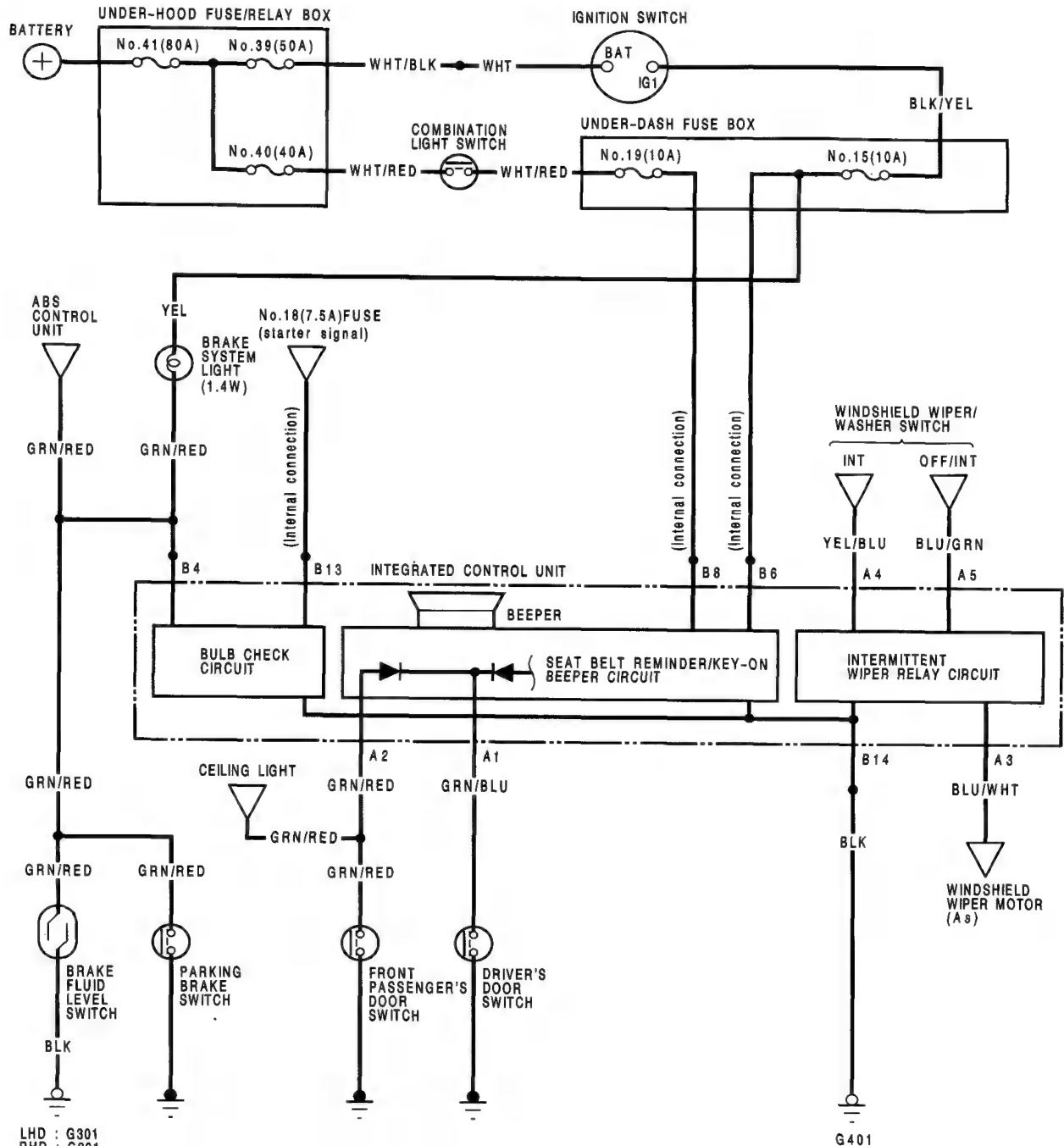
No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	YEL/BLU	Ignition switch to ON, and windshield wiper switch INT.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A) fuse. • Faulty windshield wiper switch. • An open in the wire.
3	BLU/WHT and BLU/GRN	Windshield wiper switch OFF or INT, and wiper blades in part position.	Check for continuity between the BLU/WHT and BLU/GRN terminals: there should be continuity.	<ul style="list-style-type: none"> • Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
4	BLK/GRN	Ignition switch to ON, and windshield washer motor switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A) fuse. • Faulty windshield washer switch. • An open in the wire.



Circuit Diagram (KG, KX, KQ)

Description

An integrated control unit, located behind the dashboard lower cover, integrates the functions of the bulb check circuit (brake system light), light-on beeper circuit, and the intermittent wiper circuit onto one circuit board, sharing common circuit functions.

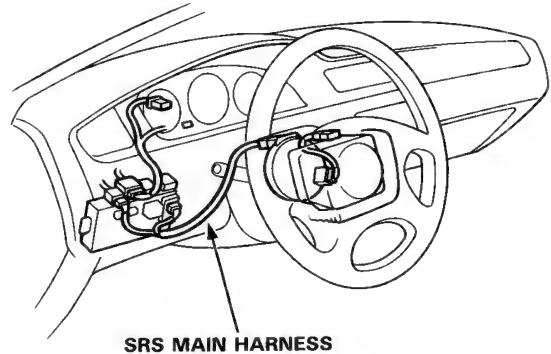


Integrated Control Unit

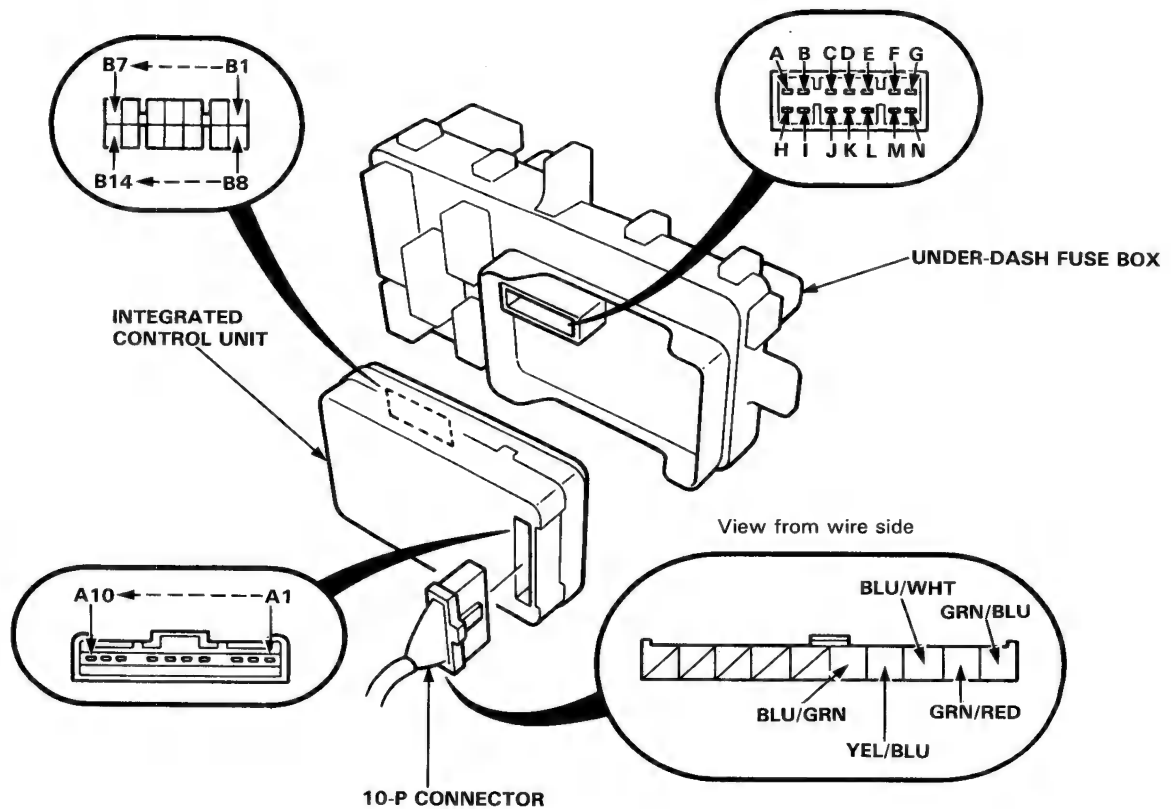
Input Test (KG, KX, KQ)

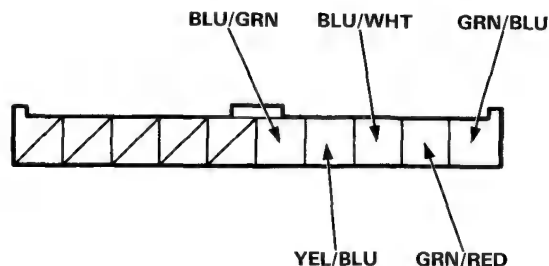
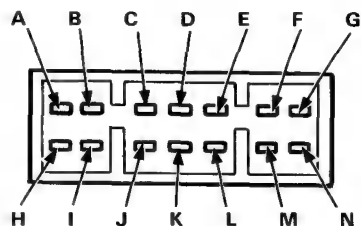
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wire harnesses, turn the ignition switch off, disconnect the negative and position battery cables, and wait at least three minutes.



NOTE: Do not disconnect any other connectors on the under-dash fuse box except the integrated control unit connector.





View from wire side.

***Bulb Check System (brake system light):**

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	M	Ignition switch at START.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 18 (15 A) fuse. • Faulty neutral safety switch (A/T). • An open in the wire.
3	D	Ignition switch to ON, brake fluid reservoir full, and parking brake lever down.	Connect to ground: brake system light should come on.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • Blown brake system light. • An open in the wire.

*: KQ

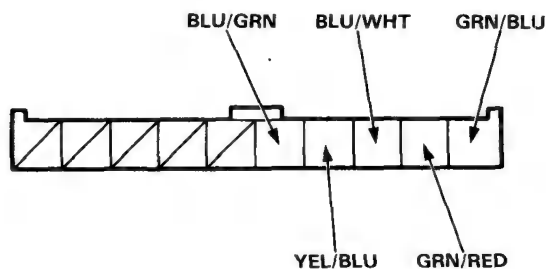
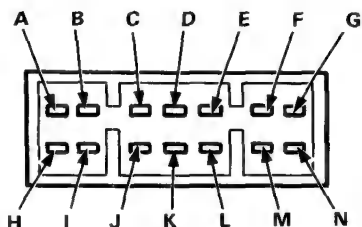
Light-on Beeper System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	I	Headlight switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (10 A) fuse. • An open in the wire.
3	F	Ignition switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
4	GRN/BLU	Driver's door opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door switch. • An open in the wire.
5	GRN/RED	Front passenger's door opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty front passenger's door switch. • An open in the wire.

(cont'd)

Integrated Control Unit

Input Test (KG, KX, KQ) (cont'd)



View from wire side.

Intermittent Wiper Relay System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	YEL/BLU	Ignition switch to ON, and windshield wiper switch INT.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield wiper switch. • An open in the wire.
3	BLU/WHT and BLU/GRN	Windshield wiper switch OFF or INT, and wiper blades in park position.	Check for continuity between the BLU/WHT and BLU/GRN terminals: there should be continuity.	<ul style="list-style-type: none"> • Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
4	BLK/GRN	Ignition switch to ON, and windshield washer motor switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield washer switch. • An open in the wire.

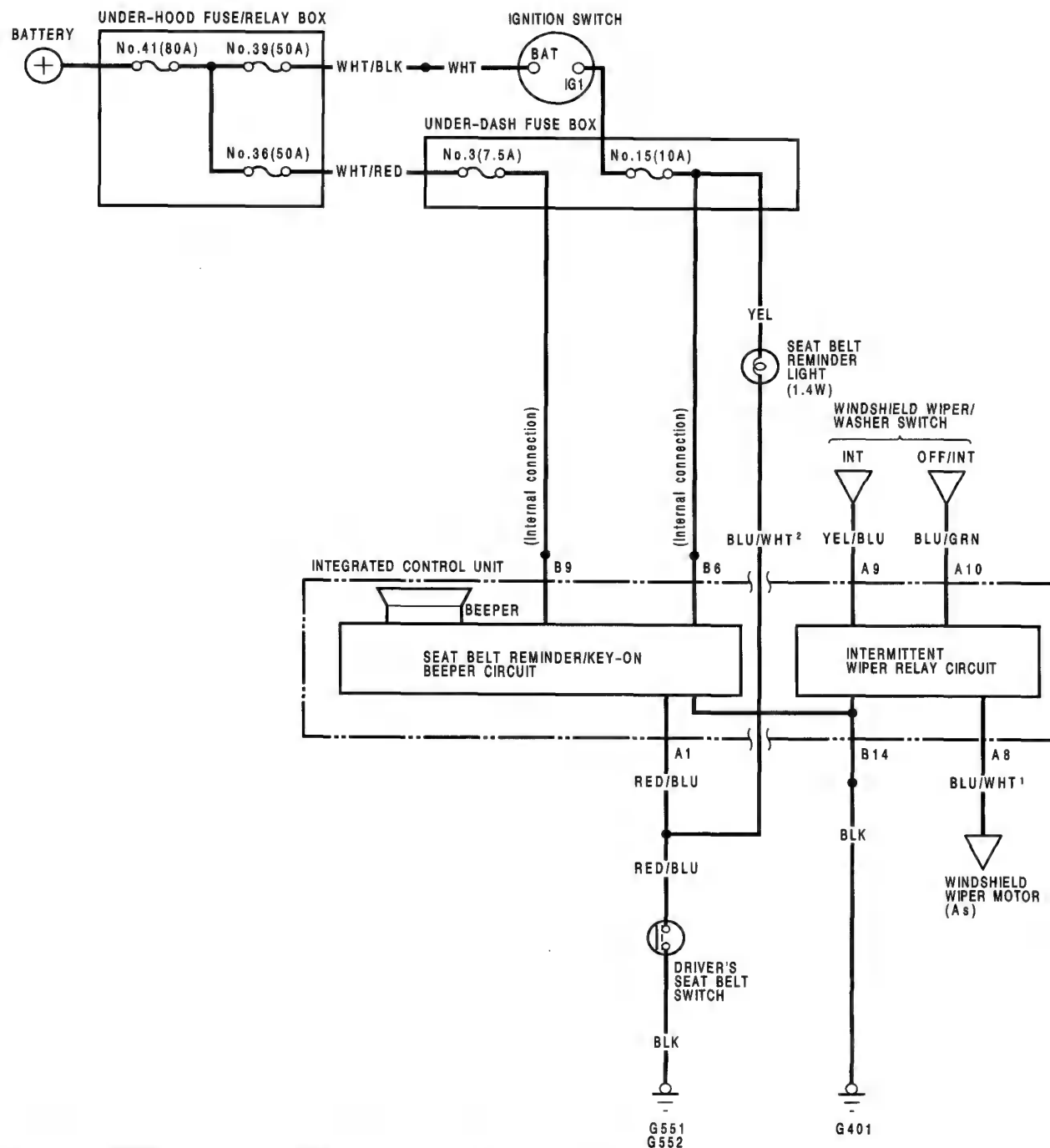


Circuit Diagram (KY, KP, KT)

Description

An integrated control unit, located behind the dashboard lower cover, integrates the functions of the seat belt reminder beeper circuit, and the intermittent wiper circuit onto one circuit board, sharing common circuit functions.

NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example BLU/WHT¹ and BLU/WHT² are not the same).

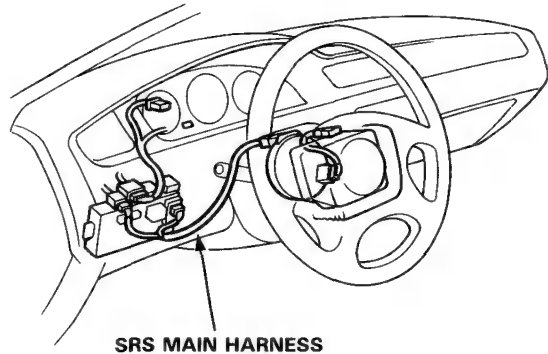


Integrated Control Unit

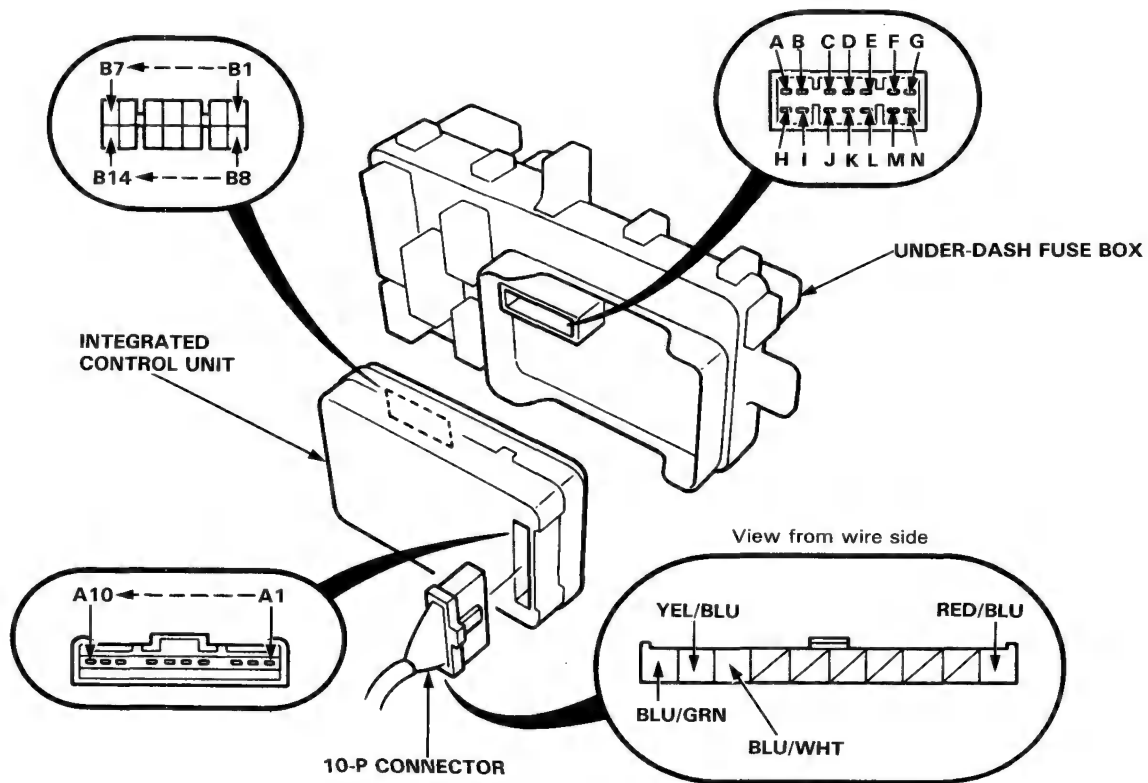
Input Test (KY, KP, KT)

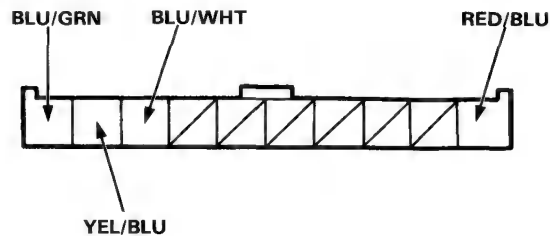
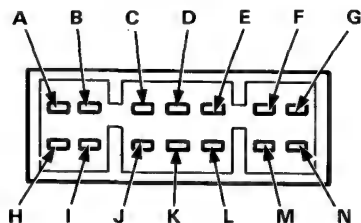
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wire harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



NOTE: Do not disconnect any other connectors on the under-dash fuse box except the integrated control unit connector.





View from wire side.

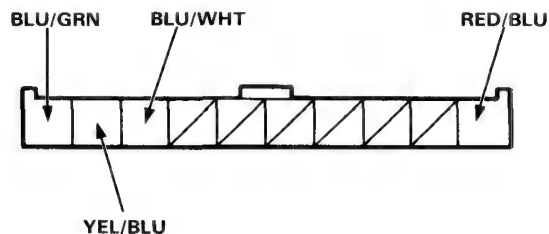
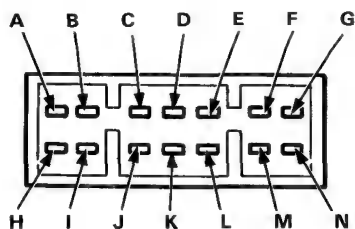
Seat Belt Reminder Beeper System (KY):

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	I	Under all conditions.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 3 (7.5 A) fuse. • An open in the wire.
3	F	Ignition switch to ON.	Check for voltage to ground: it should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
4	RED/BLU	Driver's seat belt is not buckled.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty driver's seat belt switch. • Poor ground (G551, G552). • An open in the wire.

(cont'd)

Integrated Control Unit

Input Test (KY, KP, KT) (cont'd)



View from wire side

Intermittent Wiper Relay System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401). • An open in the wire.
2	YEL/BLU	Ignition switch to ON, and windshield wiper switch INT.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield wiper switch. • An open in the wire.
3	BLU/WHT ¹ and BLU/GRN	Windshield wiper switch OFF or INT, and wiper blades in park position.	Check for continuity between the BLU/WHT ¹ and BLU/GRN terminals: there should be continuity.	<ul style="list-style-type: none"> • Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
4	BLK/GRN	Ignition switch to ON, and windshield washer motor switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield washer switch. • An open in the wire.

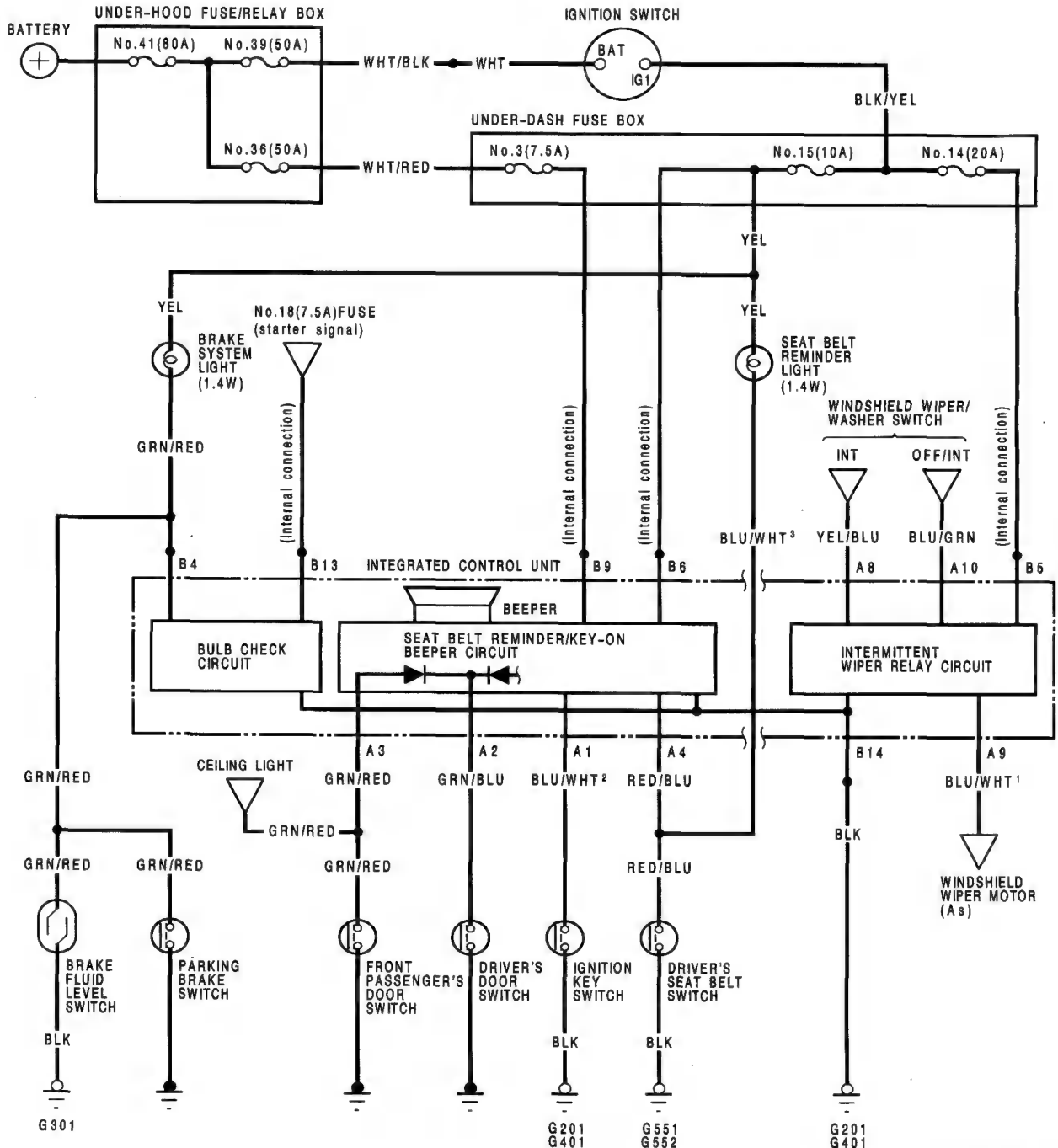


Circuit Diagram (With Key-on Reminder)

Description

An integrated control unit, located behind the dashboard lower cover, integrates the functions of the bulb check circuit (brake system light), seat belt reminder, key-on beeper circuit, and the intermittent wiper circuit onto one circuit board, sharing common circuit functions.

NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example BLU/WHT¹ and BLU/WHT² are not the same).

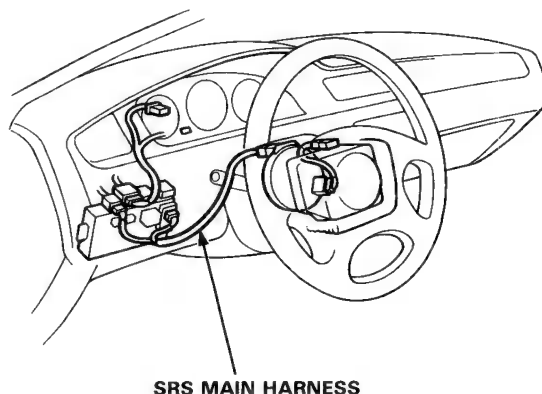


Integrated Control Unit

Input Test (With Key-on Reminder)

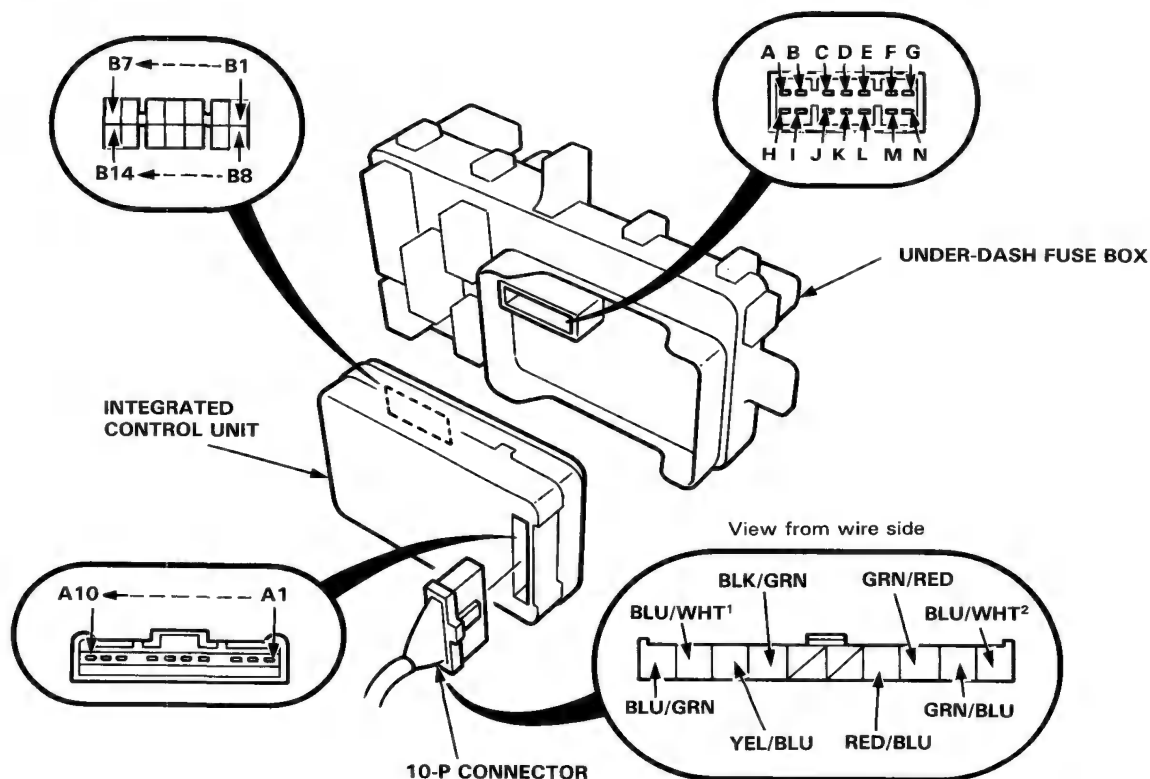
CAUTION (with SRS):

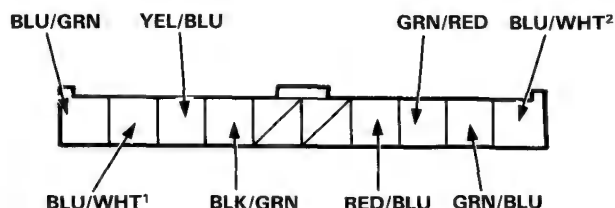
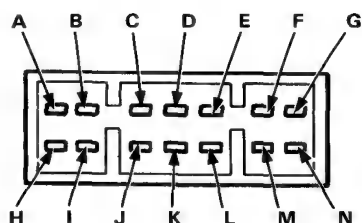
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



NOTE:

- Several different wires have the same color. They have been given a number suffix to distinguish them (for example BLU/WHT¹ and BLU/WHT² are not the same).
- Do not disconnect any other connectors on the underdash fuse box except the integrated control unit connector.





View from wire side.

Bulb Check System (brake system light):

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	M	Ignition switch at START.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 18 (15 A) fuse. • Faulty neutral safety switch (A/T). • An open in the wire.
3	D	Ignition switch to ON, brake fluid reservoir full, and parking brake lever down.	Connect to ground: brake system light should come on.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • Blown brake system light. • An open in the wire.

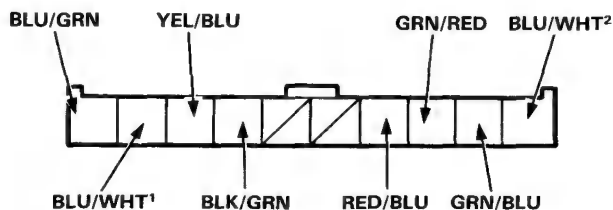
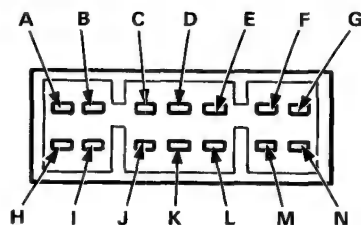
Seat Belt Reminder and Key-on Beeper System:

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	I	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 3 (7.5 A) fuse. • An open in the wire.
3	F	Ignition switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the wire.
4	GRN/BLU	Driver's door opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door switch. • An open in the wire.
5	GRN/RED	Front passenger's door opened.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty front passenger's door switch. • An open in the wire.
6	BLU/WHT²	Ignition key is inserted into the ignition switch.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty ignition key switch. • Poor ground (G201, G401). • An open in the wire.
7	RED/BLU	Driver's seat belt is not buckled.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Faulty driver's seat belt switch. • Poor ground (G551, G552). • An open in the wire.

(cont'd)

Integrated Control Unit

Input Test (With Key-on Reminder) (cont'd)



View from wire side.

Intermittent Wiper Relay System (some model versions):

No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	N	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
3	YEL/BLU	Ignition switch to ON and windshield wiper switch INT.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield wiper switch. • An open in the wire.
4	BLU/WHT¹ and BLU/GRN	Windshield wiper switch OFF or INT and wiper blades in park position.	Check for continuity between the BLU/WHT¹ and BLU/GRN terminals: there should be continuity.	<ul style="list-style-type: none"> • Faulty windshield wiper switch. • Faulty windshield wiper motor. • An open in the wire.
5	BLK/GRN	Ignition switch to ON and windshield washer motor switch to ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 14 (20 A). • Faulty windshield washer switch. • An open in the wire.



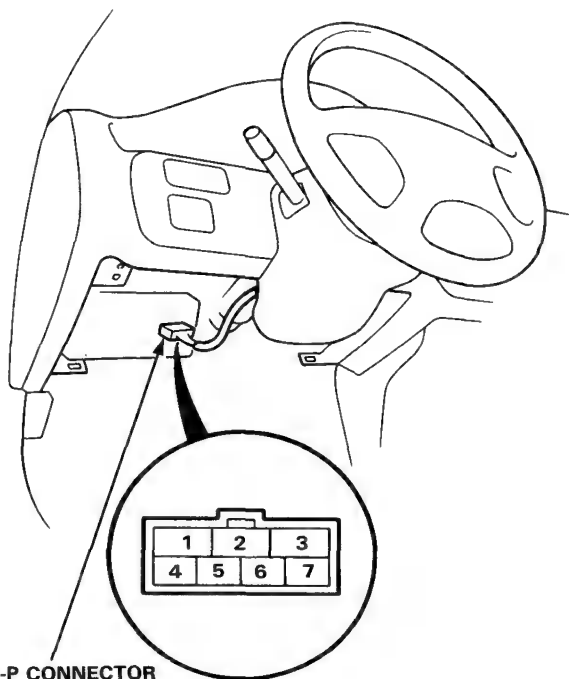
Key-on Reminder

Ignition Key Switch Test

NOTE: Refer to page 23-201 for the wiring description of the key-on beeper circuit diagram, and page 23-202 for the input test of the beeper circuit.

When the ignition key is not removed, the key-on beeper in the integrated control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch. With ground at the "A1" and "A3" terminals, the beeper sounds.

1. Remove the dashboard lower cover (see page 23-72).
2. Disconnect the 7-P connector from the under-dash fuse box.



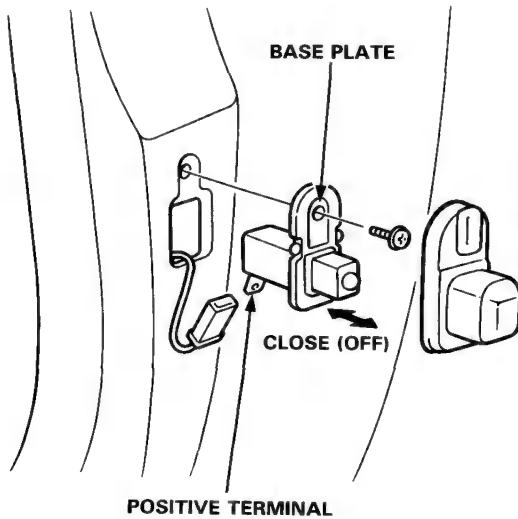
3. There should be continuity between the No. 2 and No. 4 terminals when the ignition key is inserted into the ignition key cylinder. There should be no continuity with the ignition key removed.

Door Switch

Test

1. Open the door.
2. Remove the screw, then pull out the door switch.
3. Disconnect the 1-P connector from the switch.

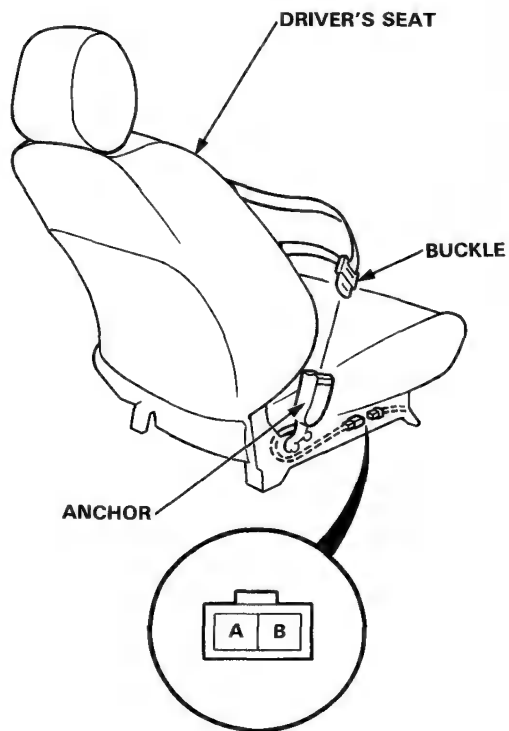
4. There should be continuity between the positive terminal and base plate (ground) with the switch released (door opened). There should be no continuity with the switch pushed (door closed).



Seat Belt Reminder

Seat Belt Switch Test

1. Slide the driver's seat back, then disconnect the 2-P connector from the seat belt switch under it.
2. There should be continuity between the A and B terminals when the driver's seat belt is not buckled. There should be no continuity when the driver's seat belt is buckled.



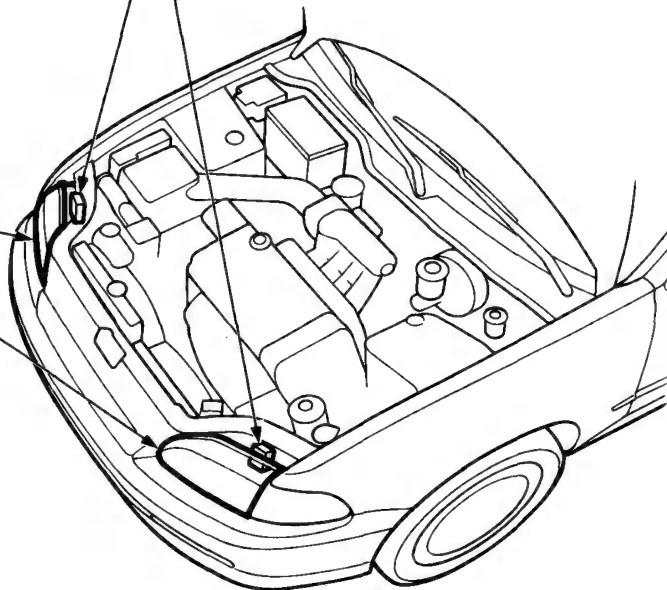
Lighting System

Component Location Index (LHD)

DAYTIME RUNNING LIGHTS RELAY (KS) HEADLIGHT ADJUSTER UNIT (KG)
(in the integrated control unit) Input Test, page 23-219
Input Test, page 23-186

HEADLIGHTS

Adjustment, page 23-216
Replacement, page 23-217

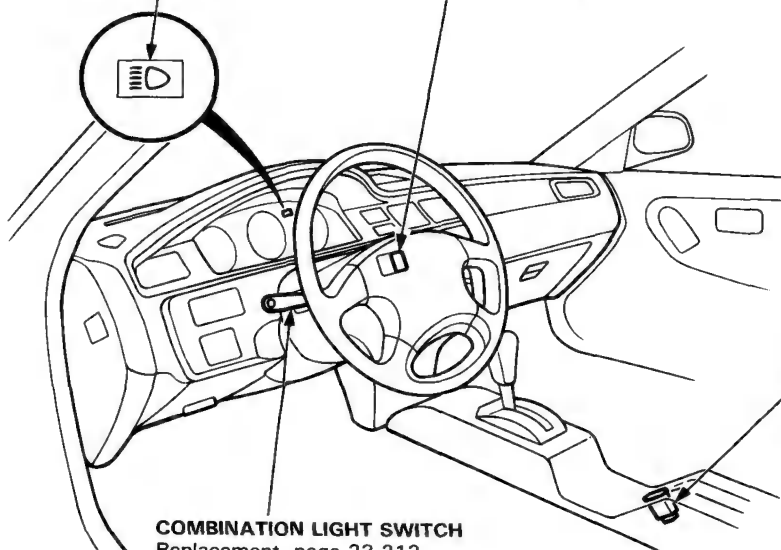


HIGH BEAM INDICATOR

LIGHT (in the gauge assembly)
Gauge Assembly, page 23-147)

REAR FOG LIGHT SWITCH

(except KY)
Removal/Test, page 23-215



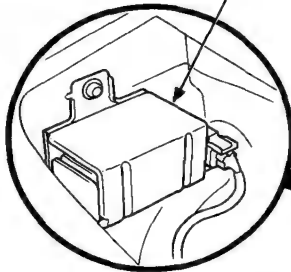
HEADLIGHT ADJUSTER SWITCH (KG)
Removal/Test, page 23-220

COMBINATION LIGHT SWITCH
Replacement, page 23-213
Test, page 23-214

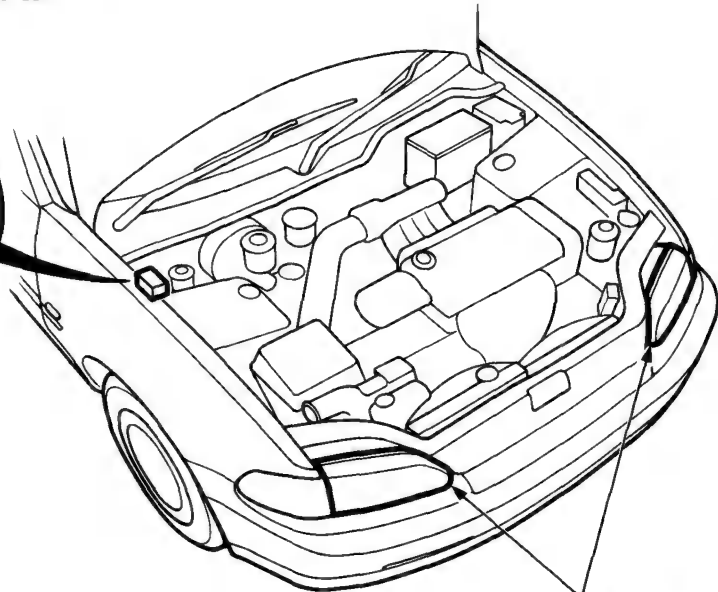


Component Location Index (RHD)

DIM-DIM RESISTOR (KE)
Test, page 23-217

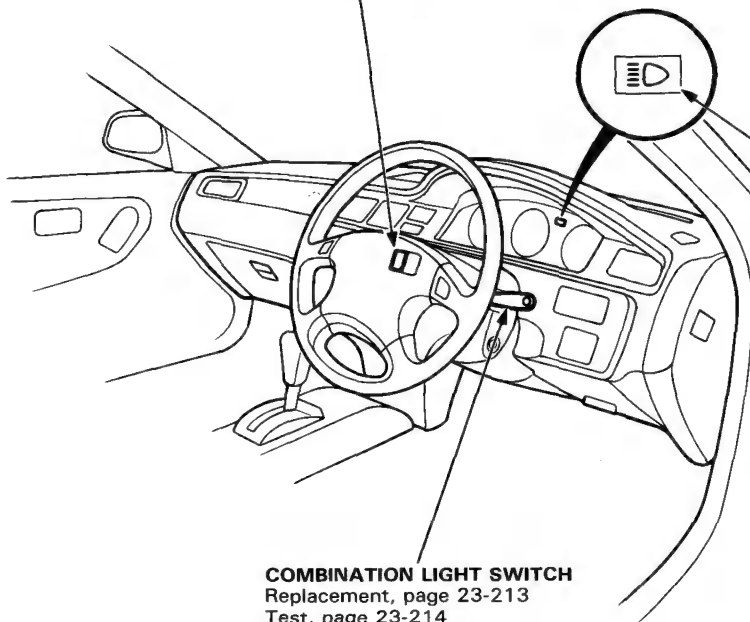


DIM-DIM HEADLIGHT RELAY (KE)
(in the integrated control unit)
Input Test, page 23-190



HEADLIGHTS
Adjustment, page 23-216
Replacement, page 23-117

REAR FOG LIGHT SWITCH (KE)
Removal/Test, page 23-215



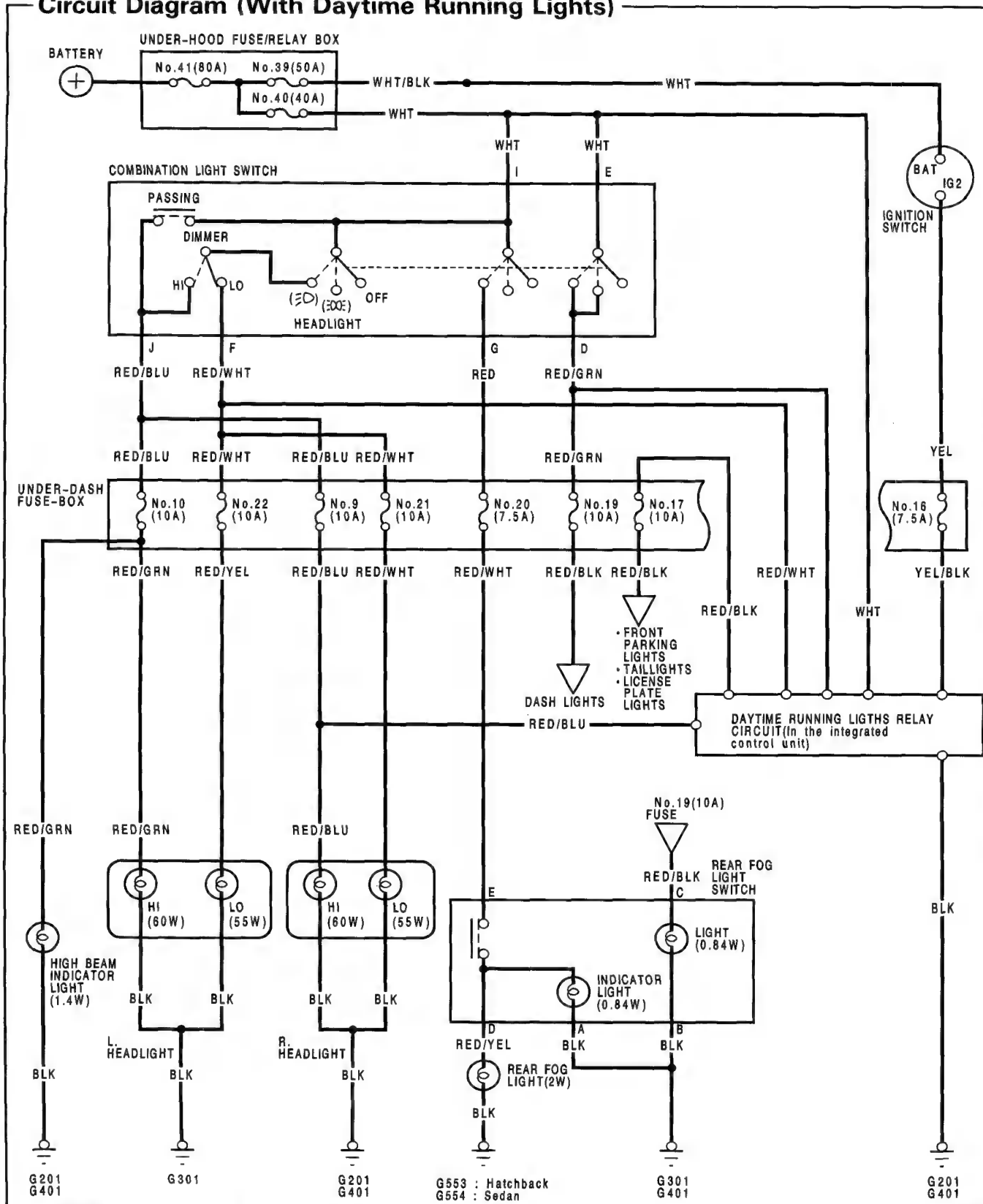
COMBINATION LIGHT SWITCH
Replacement, page 23-213
Test, page 23-214

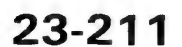


**HIGH BEAM INDICATOR
LIGHT** (in the gauge assembly)
Gauge assembly, page 23-147

Lighting System

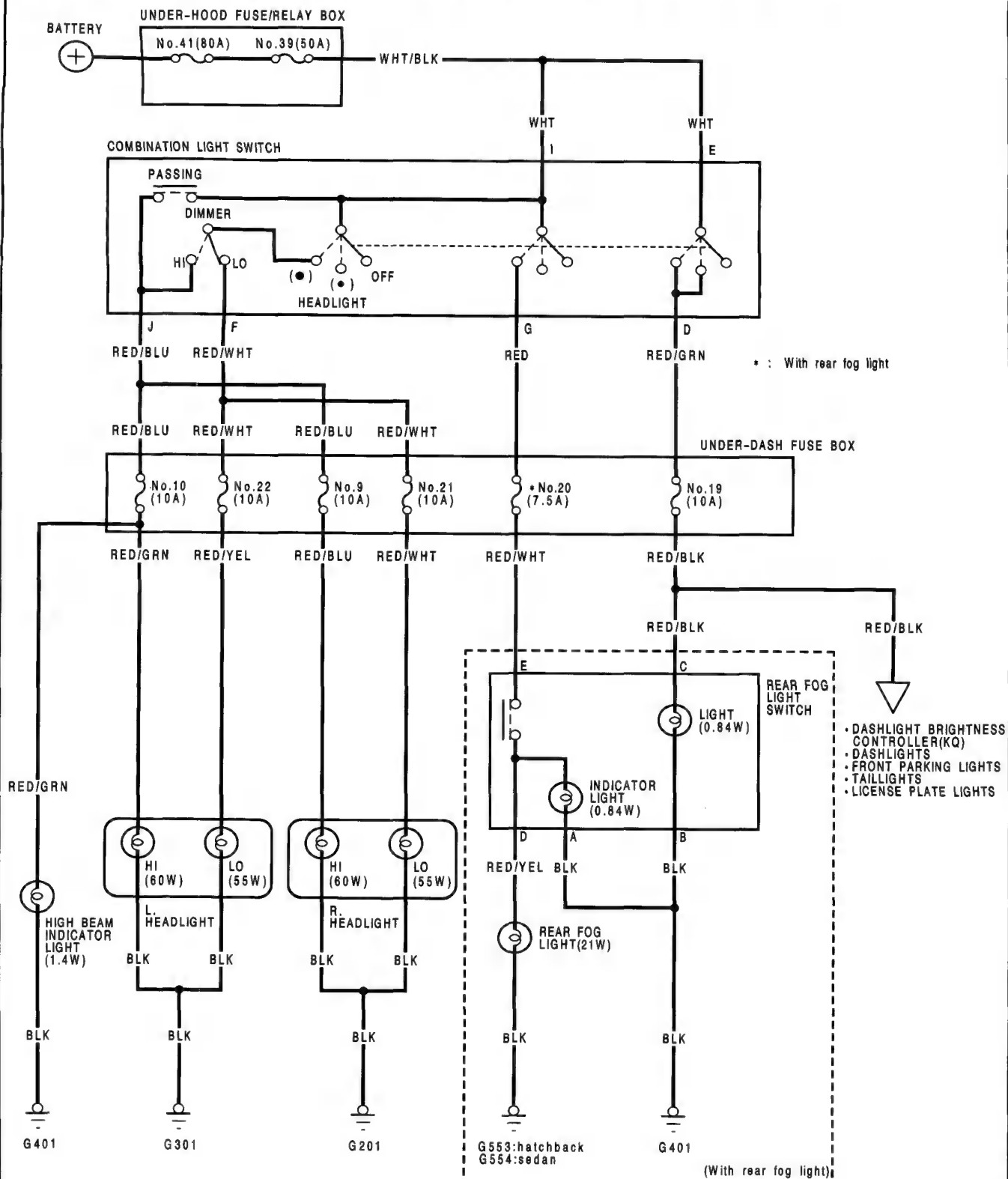
Circuit Diagram (With Daytime Running Lights)





Lighting System

Circuit Diagram (Except Daytime Running Lights/Dim-Dip Headlights)

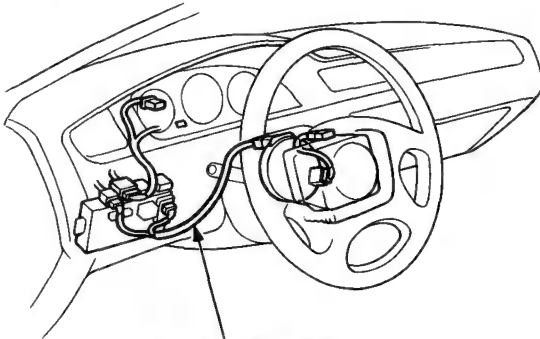




Combination Light Switch Replacement

CAUTION (with SRS):

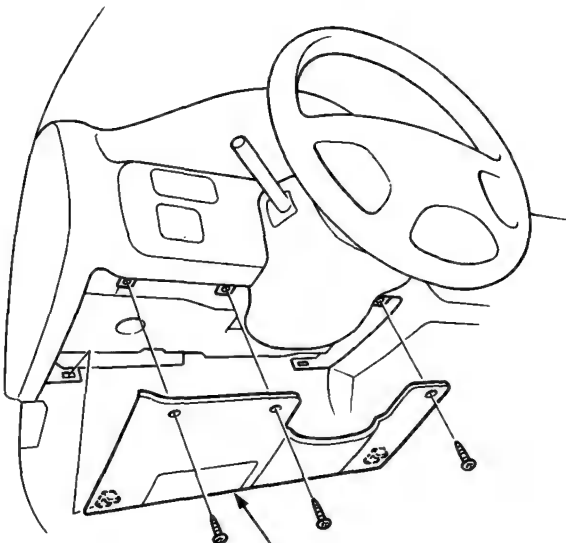
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

NOTE: The illustration shows LHD type; RHD type is symmetrical.

1. Remove the dashboard lower cover.



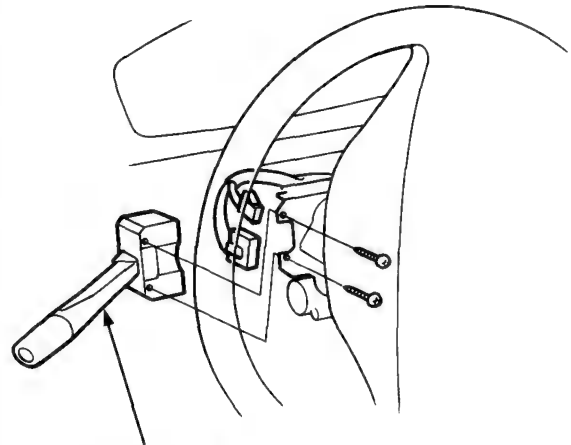
DASHBOARD
LOWER COVER

2. Remove the steering column covers.



LOWER COVER

3. Disconnect the 4-P and 7-P connectors from the combination light switch, then remove the 2 screws and lift out the switch.



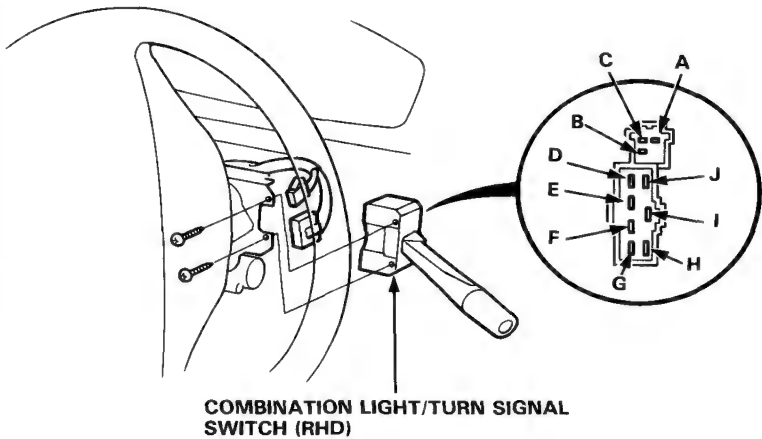
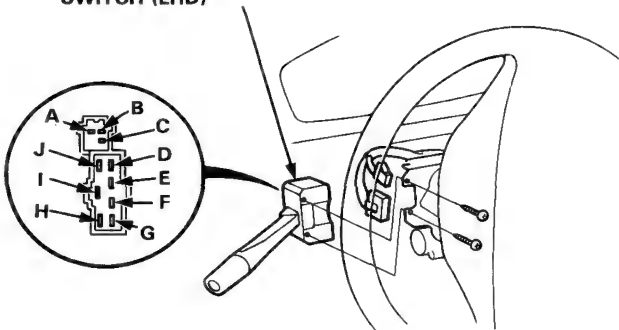
COMBINATION
LIGHT SWITCH

Lighting System

Combination Light/Turn Signal Switch Test

- 1. Remove the dashboard lower cover and steering column covers as shown on the previous page.
- 2. Disconnect the 4-P connector and 7-P connectors from the switch.
- 3. Check for continuity between the terminals in each switch position according to the table.

COMBINATION LIGHT/TURN SIGNAL SWITCH (LHD)



Combination Light Switch:

Terminal		D	E	F	G (With rear fog light)	I	J
Headlight switch	OFF						
	or						
	LOW						
	HIGH						
Passing switch	OFF						
	ON						

Turn Signal Switch:

Terminal		A	B	C
Position	R			
	NEUTRAL			
	L			

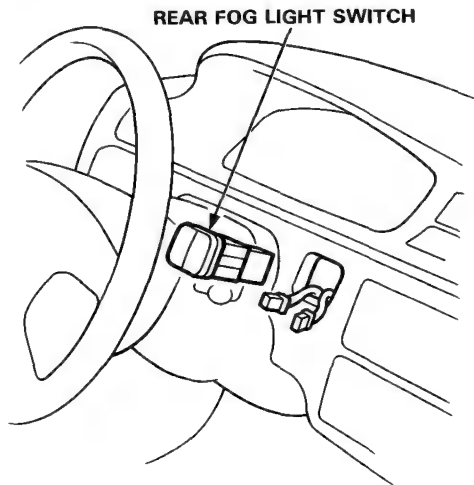


Rear Fog Light Switch Removal/Test

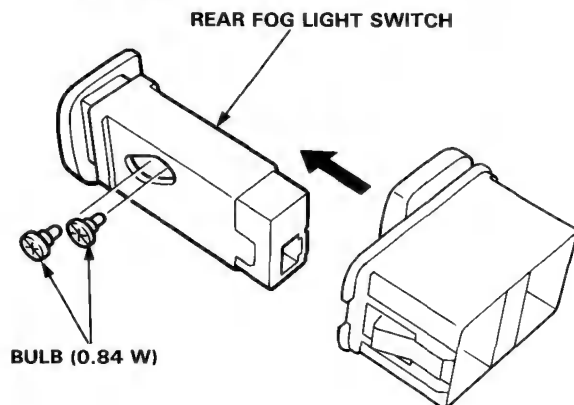
NOTE: Be careful not to damage the instrument panel.

1. Carefully pry the switch out of the instrument panel.
2. Disconnect the 5-P connectors from the switches.

NOTE: The illustration shows LHD type; RHD type is symmetrical.

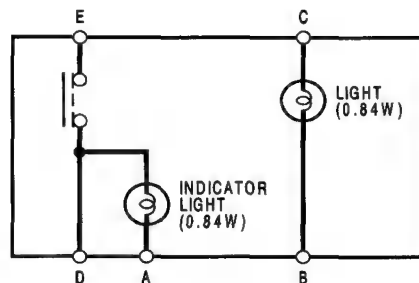
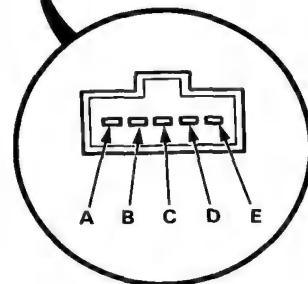
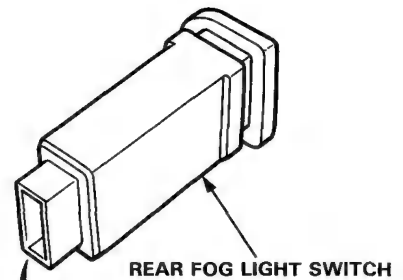


3. Turn the socket 45° counterclockwise to remove either bulb.



4. Check for continuity between the terminals according to the table.

Terminal Position	A		B		C	D	E
ON	○	⊗	○	⊗	○	○	○
OFF	○		○	⊗	○	○	

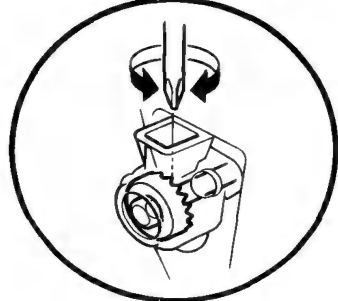
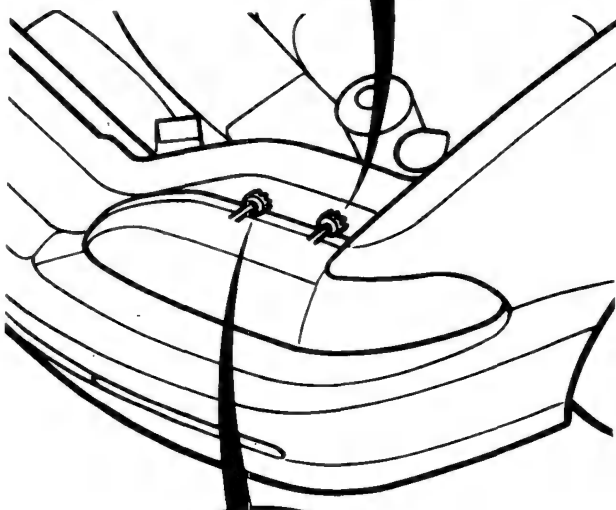
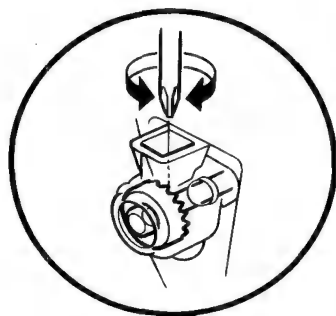


Lighting System

Headlights Adjustment

NOTE: Adjust the headlights to local requirements.

HORIZONTAL ADJUSTING
POINT



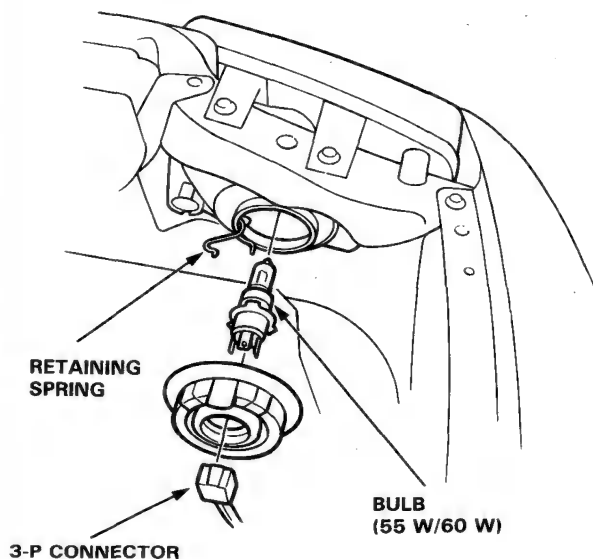
VERTICAL ADJUSTING
POINT

Bulb Replacement

CAUTION:

- Halogen headlights can become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.
- Do not try to replace or clean the headlights with the lights on.

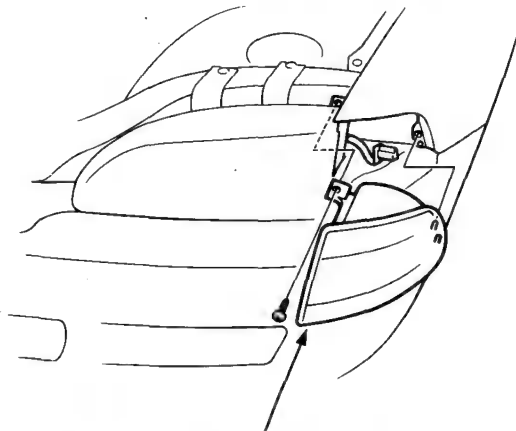
1. Disconnect the 3-P connector from the bulb, then remove the retaining spring.





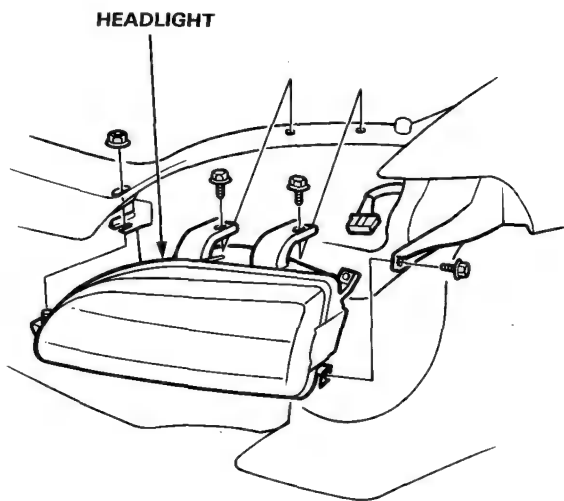
Headlight Replacement

1. Remove the front turn signal/parking lights.



FRONT TURN SIGNAL/PARKING LIGHTS

2. Remove the front bumper (see Section 20).
3. Remove the mounting bolt and nuts, then pull out the headlight and disconnect the connector from it.



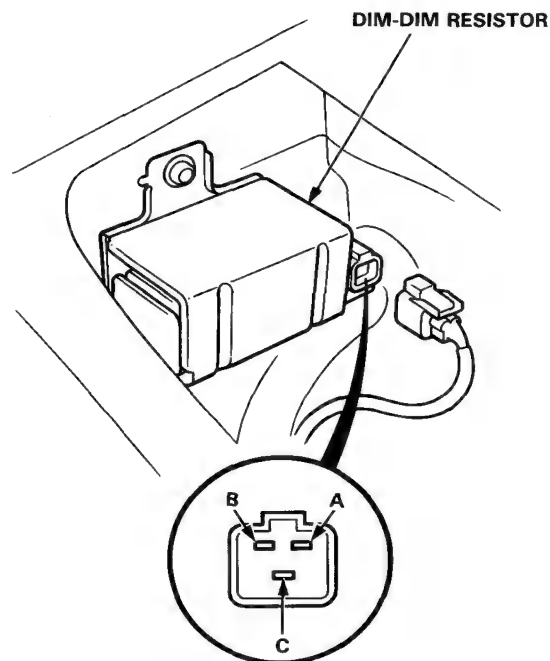
4. After replacement, adjust the headlights to local requirements.

Dim-Dip Resistor Test

CAUTION: The dim-dip resistor becomes very hot during the use of the dim-dip headlights; do not touch it or the attaching hardware immediately after the lights have been turned off.

1. Disconnect the 3-P connector from the resistor.
2. Measure the resistance between the resistor terminals (A and B) and the power terminal (C).

Resistance: $1.6 \Omega \pm 0.08 \Omega$



View from terminal side

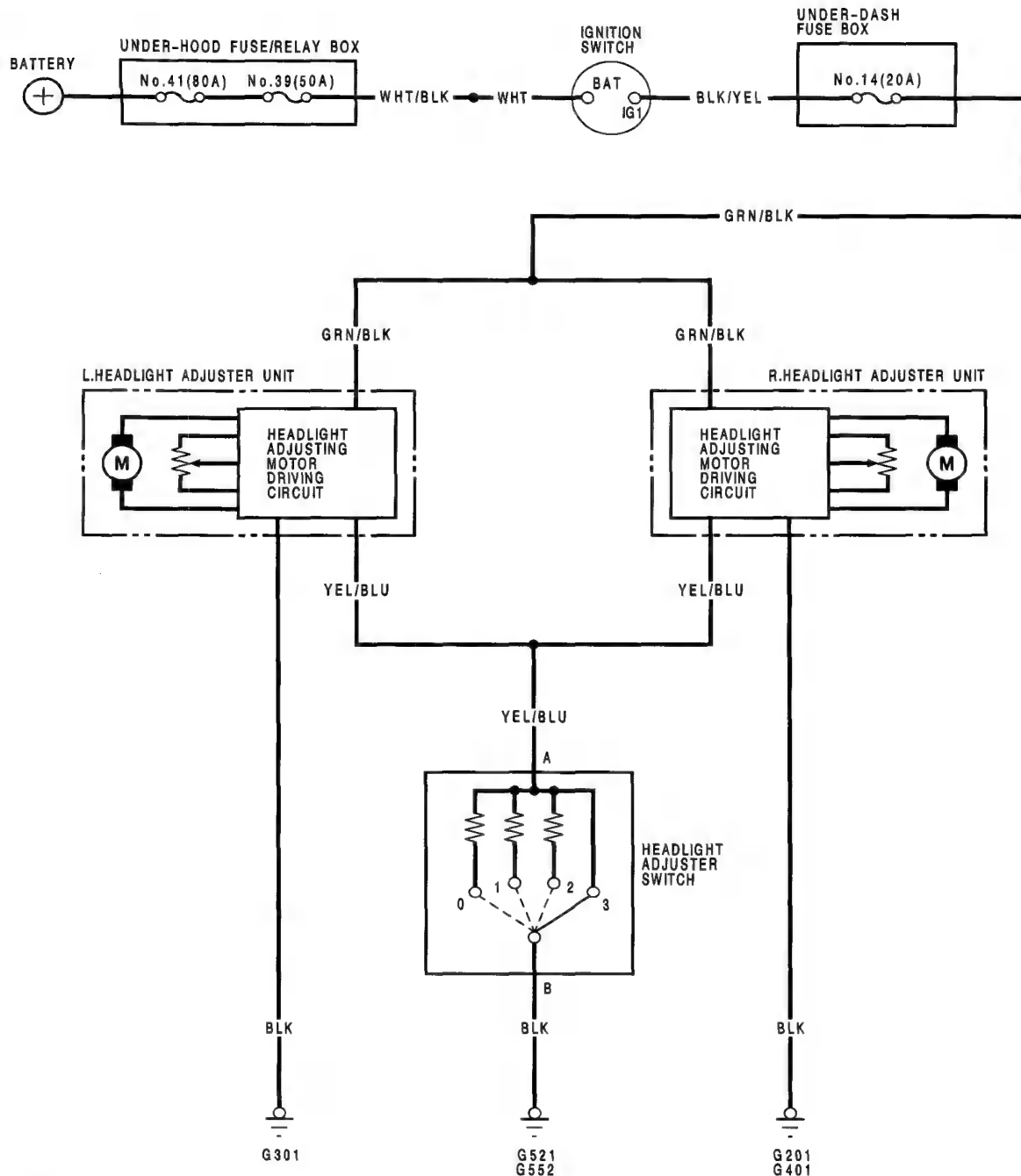
- Replace the resistor with a new one if any of the resistances are beyond specification.

Headlight Adjuster (KG)

Circuit Diagram

Discription:

The motor-driven type headlight adjuster is mounted behind the headlight unit. When you operate the adjuster switch, the motor driving circuit senses ground through each resistor and the headlight adjuster is actuated.

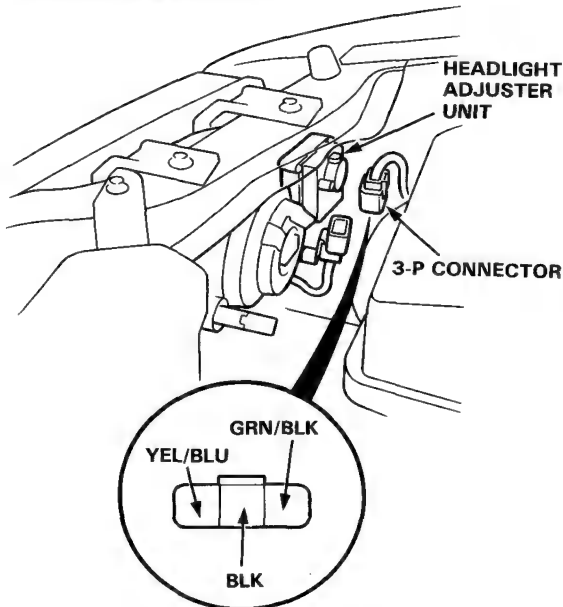




Headlight Adjuster Unit Input Test

NOTE: Before testing, check for blown No. 14 (20 A) fuse in the under-dash fuse box.

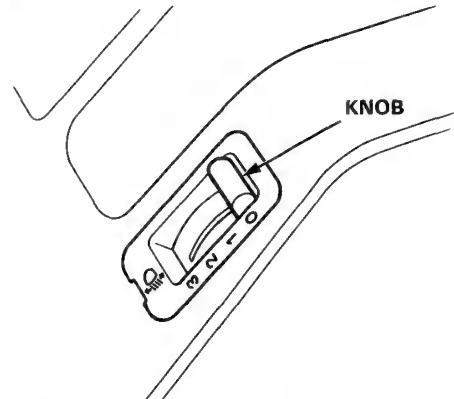
1. Disconnect the 3-P connector for the right and left headlight adjuster units.



View from terminal side

2. Check for continuity between the BLK terminal and ground.
There should be continuity.
 - If there is no continuity, check for:
 - An open in the BLK wire.
 - Poor ground (G201, G301).
 - If there is continuity, go to step 3.
3. Check for voltage between the GRN/BLK terminal and body ground with the ignition switch ON.
There should be battery voltage.
 - If there is no voltage, check for an open in the GRN/BLK wire.
 - If there is battery voltage, go to step 4.

4. Using an ohmmeter, measure resistance between the BLU terminal and body ground with the headlight adjuster switch in position "O". There should be approximately 768 Ω .
 - If resistance is not within specification, check for
 - An open in the YEL/BLU wire.
 - Faulty headlight adjuster switch.
 - If resistance is within specification, go to step 5.



5. If all tests are normal, but the headlight adjuster unit does not operate, check for frozen, stuck or improperly installed headlight adjuster unit. If the mechanical check is OK, replace the headlight adjuster unit.

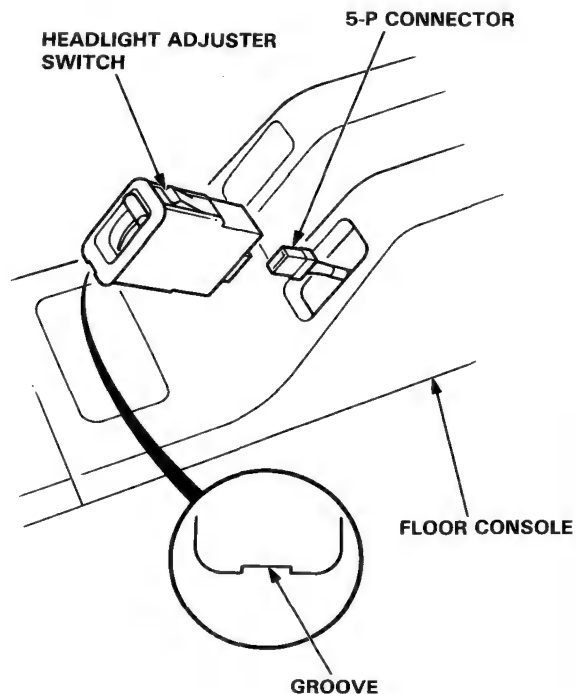
NOTE: After testing, check for good connection of the 3-P connectors. For example, malfunction of the headlight adjuster is caused by improper connection at one side.

Headlight Adjuster (KG)

Headlight Adjuster Switch Removal/Test

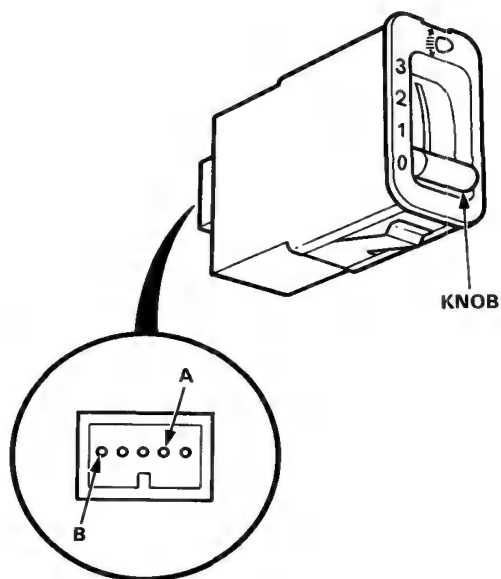
NOTE: Be careful not to damage the floor console.

1. Carefully pry the switch out of the floor console.
2. Disconnect the 5-P connector from the switch.



3. Measure the resistance between the A and B terminals at positions 0, 1, 2, and 3 by moving the knob.

Replace the switch if the resistance is not within specifications.

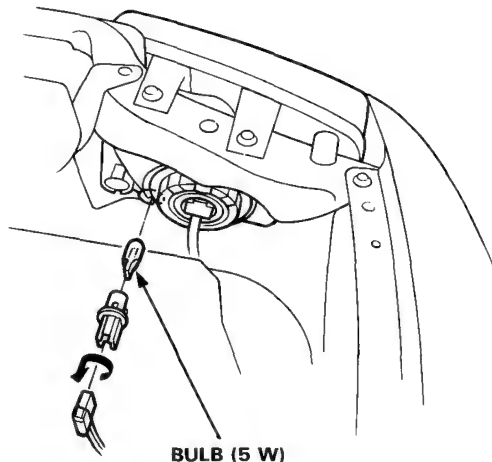


Knob Position	0	1	2	3
Resistance (Ω)	768	348	162	0

Front Parking Lights (Except KY)

Replacement

1. Turn the bulb socket 45° counterclockwise to remove it from the housing.

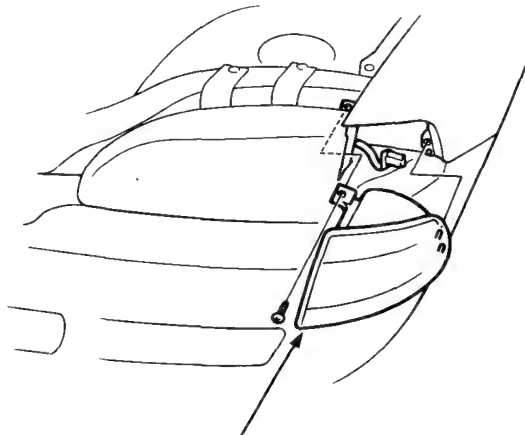


Front Turn Signal/ Parking Lights



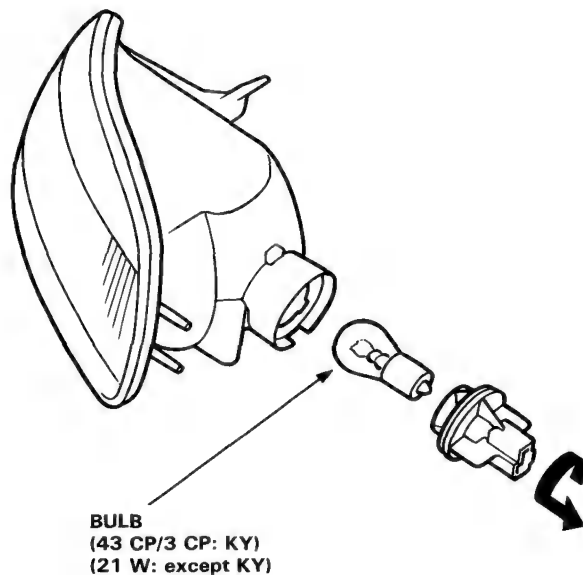
Replacement

1. Remove the screw and separate the light from the headlight.



FRONT TURN SIGNAL/PARKING LIGHTS

2. Turn the bulb socket 45° counterclockwise to remove it from the housing.

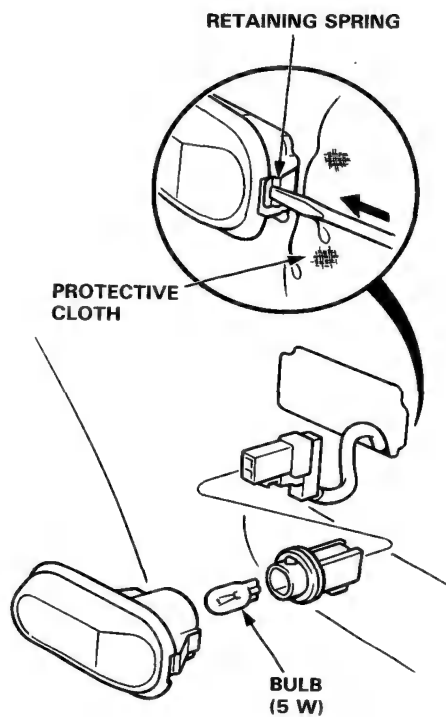


Side Turn Signal Light

Replacement

NOTE: Be careful not to damage the body.

1. Carefully pry the side turn signal light out of the front fender.

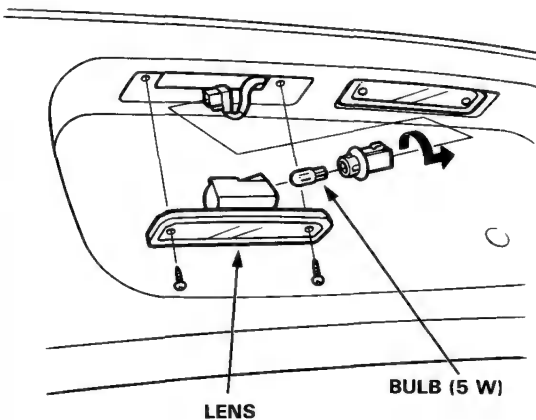


License Plate Lights

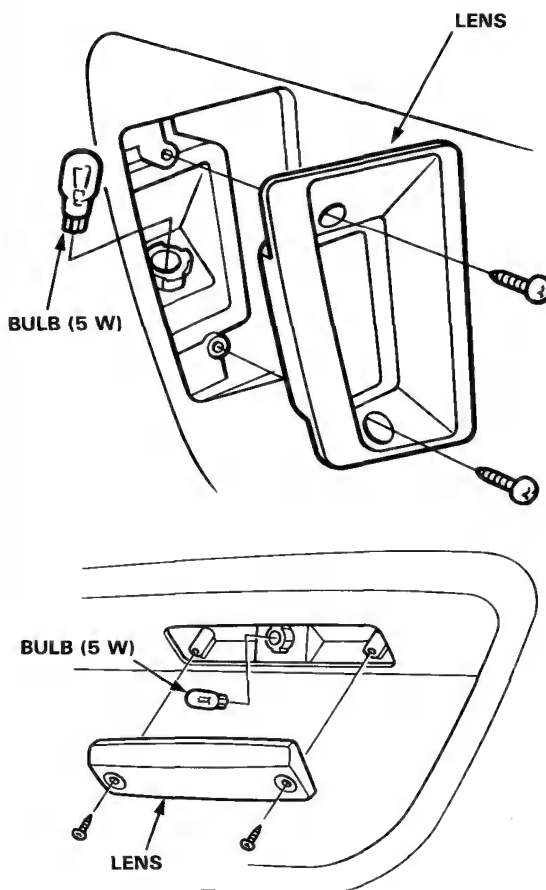
Replacement

1. Remove the 2 screws, then pull out the lens.

Hatchback:



Sedan:

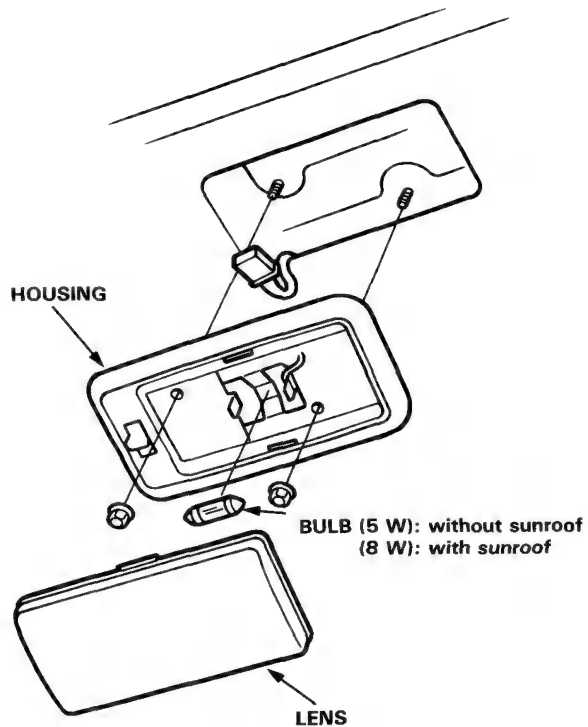


Ceiling Light



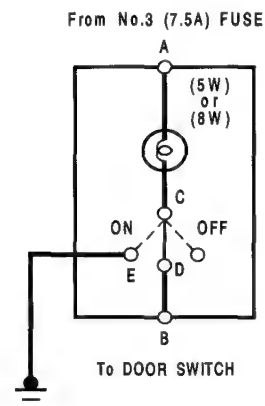
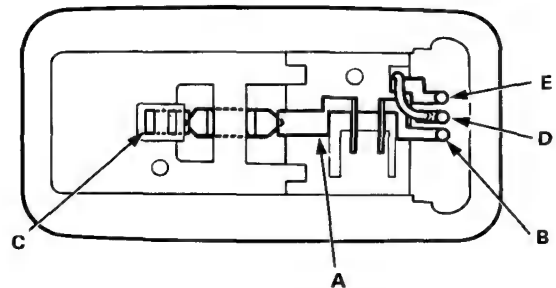
Test/Replacement

1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the 2 mounting nuts, then pull out the housing.
4. Disconnect the connector from the housing.



5. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A		B	C	D	E
OFF	○	○		○		
MIDDLE	○	○	○	○	○	
ON	○	○		○		○

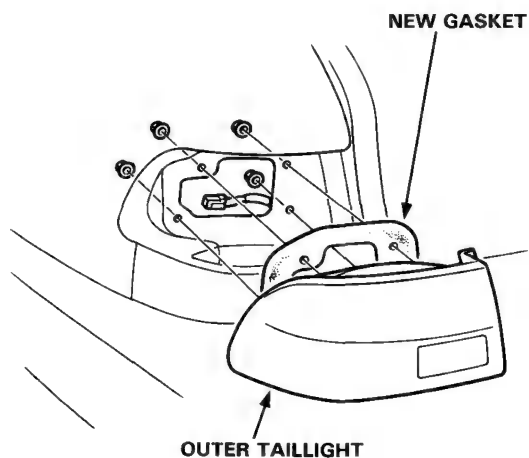


Taillights (Hatchback)

Replacement

Outer Taillight:

1. Open the rear hatch and tailgate, then remove the side lining (see Section 14).
2. Disconnect the 4-P connector from the outer taillight.
3. Remove the 4 mounting nuts, then pull out the outer taillight.

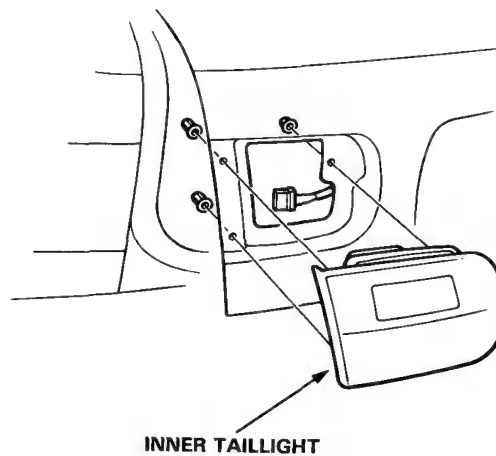


NOTE:

- Inspect the gasket. Replace it if it is distorted or stays compressed.
- After installation, run water over the lights to make sure they don't leak.

Inner Taillight:

1. Open the rear hatch, then remove the access panel.
2. Disconnect the 4-P connector from the inner taillight.
3. Remove the 3 mounting nuts, then pull out the inner taillight.

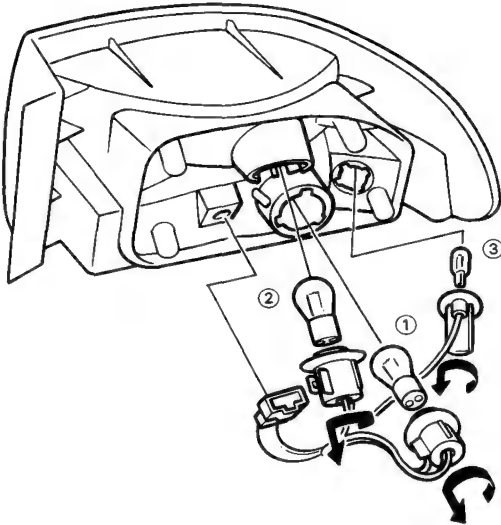




Bulb Replacement

Outer Taillight:

1. Open the rear hatch, then remove the access panel.
2. Remove the bulb from the bulb housing.

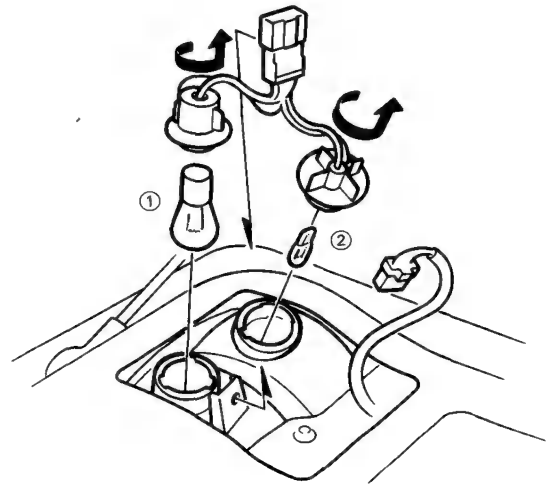


- ① BRAKE/TAILLIGHT BULB (21W/5 W)
- ② TURN SIGNAL LIGHT BULB (21 W)
- ③ REAR PARKING LIGHT BULB (3 CP): some model versions

Inner Taillight:

1. Open the rear hatch and tailgate, then remove the access panel.
2. Remove the bulb from the bulb housing.

NOTE: The illustration shows left side of LHD type; RHD type is symmetrical.



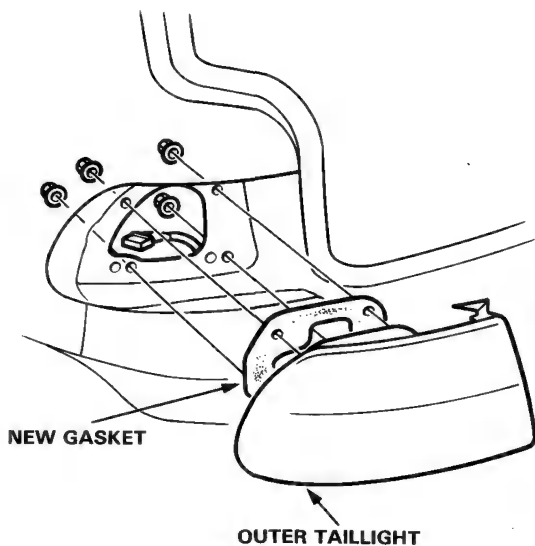
- ① BACK-UP LIGHT BULB (21 W)
- ② TAILLIGHT BULB (3 CP): some model versions
REAR FOG LIGHT (21 W): with rear fog light

Taillights (Sedan)

Replacement

Outer Taillight:

1. Open the trunk lid, then remove the access panel.
2. Disconnect the 4-P connector from the outer taillight.
3. Remove the 4 mounting nuts, then pull out the outer taillight.

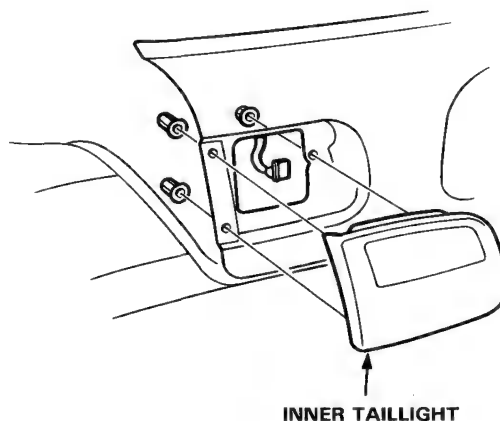


NOTE:

- Inspect the gasket. Replace it if it is distorted or stays compressed.
- After installation, run water over the lights to make sure they don't leak.

Inner Taillight:

1. Open the trunk lid, then disconnect the 5-P connector from the inner taillight.
2. Remove the 3 mounting nuts, then pull out the taillight.

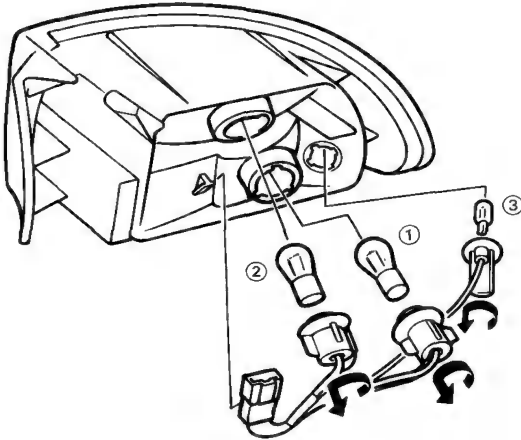




Bulb Replacement

Outer Taillight:

1. Open the trunk lid, then remove the access panel.
2. Remove the bulb from the bulb housing.

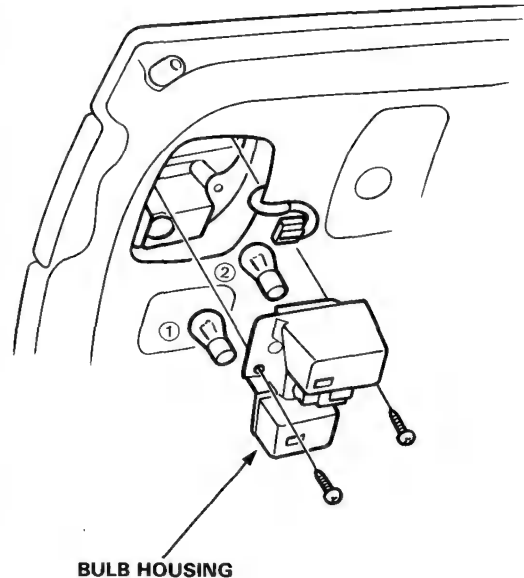


- ① BRAKE/TAILLIGHT BULB (21 W/5 W)
- ② TURN SIGNAL LIGHT BULB (21 W)
- ③ REAR PARKING LIGHT BULB (3CP): some model versions

Inner Taillight:

1. Open the trunk lid, then remove the bulb housing.
2. Remove the bulb from the bulb housing.

NOTE: The illustration shows left side of LHD type; RHD type is symmetrical.

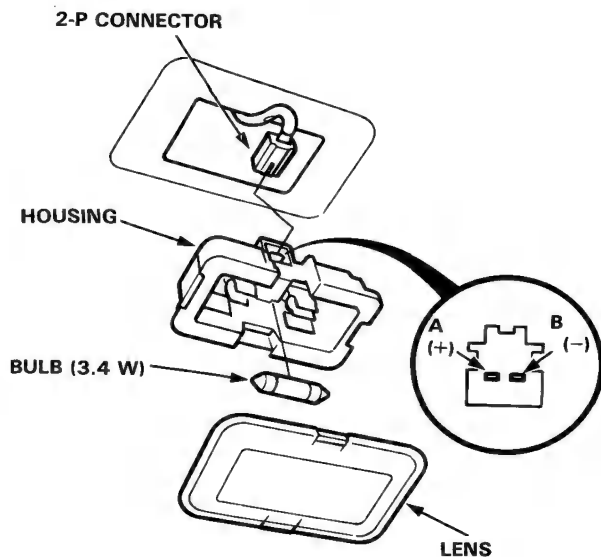


- ① BACK-UP LIGHT BULB (21 W)
- ② BRAKE/TAILLIGHT BULB (32CP/2CP): some model versions
REAR FOG LIGHT BULB (21 W): with rear fog light

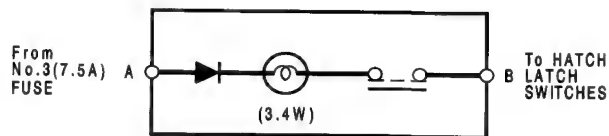
Trunk/Cargo Area Light

Test/Replacement

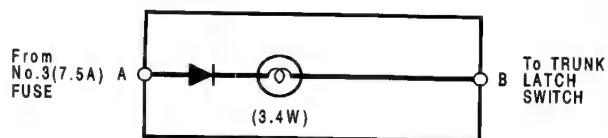
1. Pry the trunk/cargo area light lens out of its housing.
2. Pry out the light assembly.
3. Disconnect the 2-P connector from the housing.
4. Make sure that the bulb is in good condition. Check for continuity between A(+) and B(-) terminals.



Hatchback:



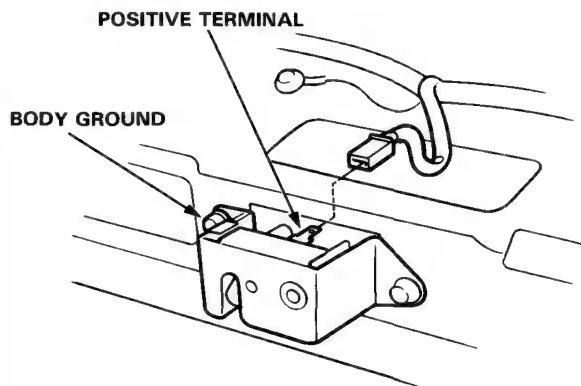
Sedan:



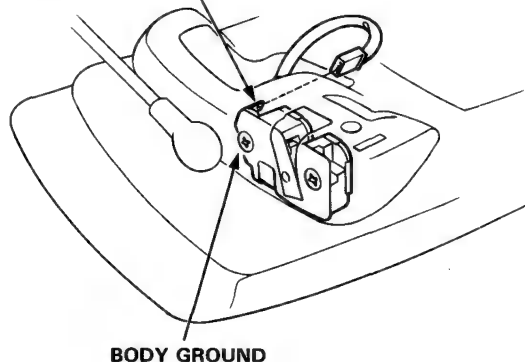
Latch Switch Test/Replacement

1. Open the hatch or trunk lid, then remove the trim panel (see Section 20).
2. Disconnect the connector from the latch switch.
3. There should be continuity between the positive terminal and body ground when the latch is in the opened position, no continuity when it's in the closed position.

Hatchback:

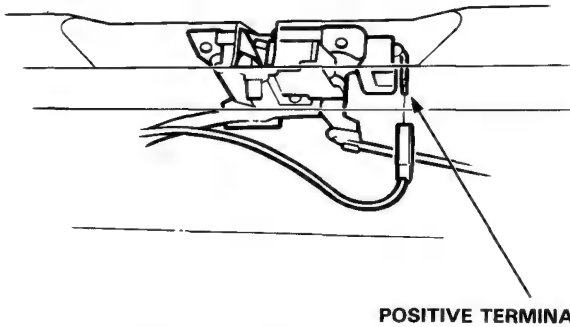


POSITIVE TERMINAL



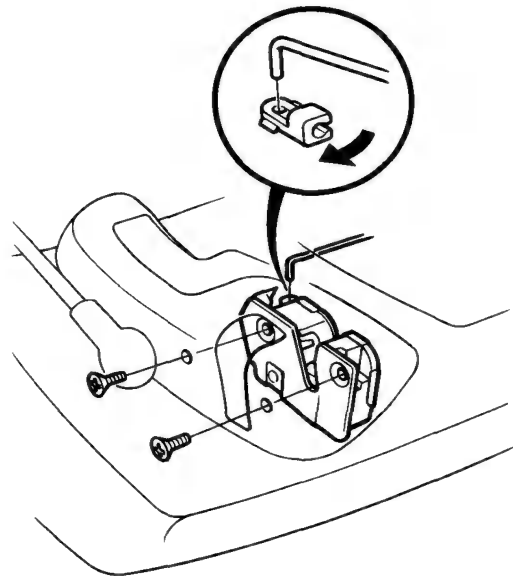
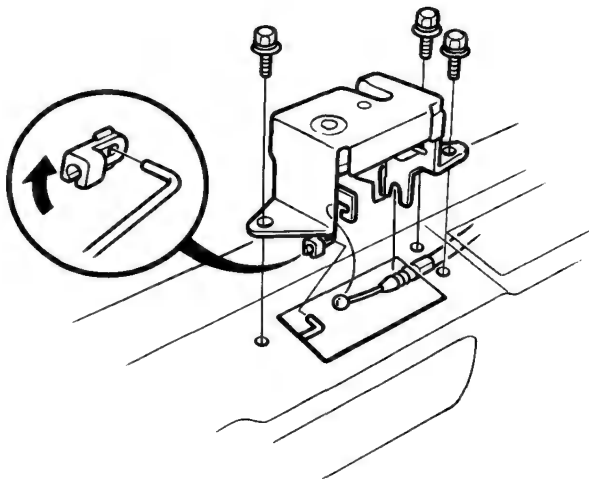


Sedan:

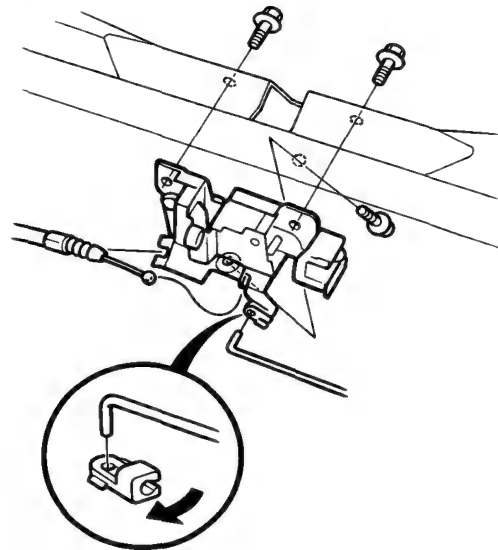


4. If necessary, remove the mounting bolts, then remove the latch assembly.
The switch cannot be replaced separately.

Hatchback:

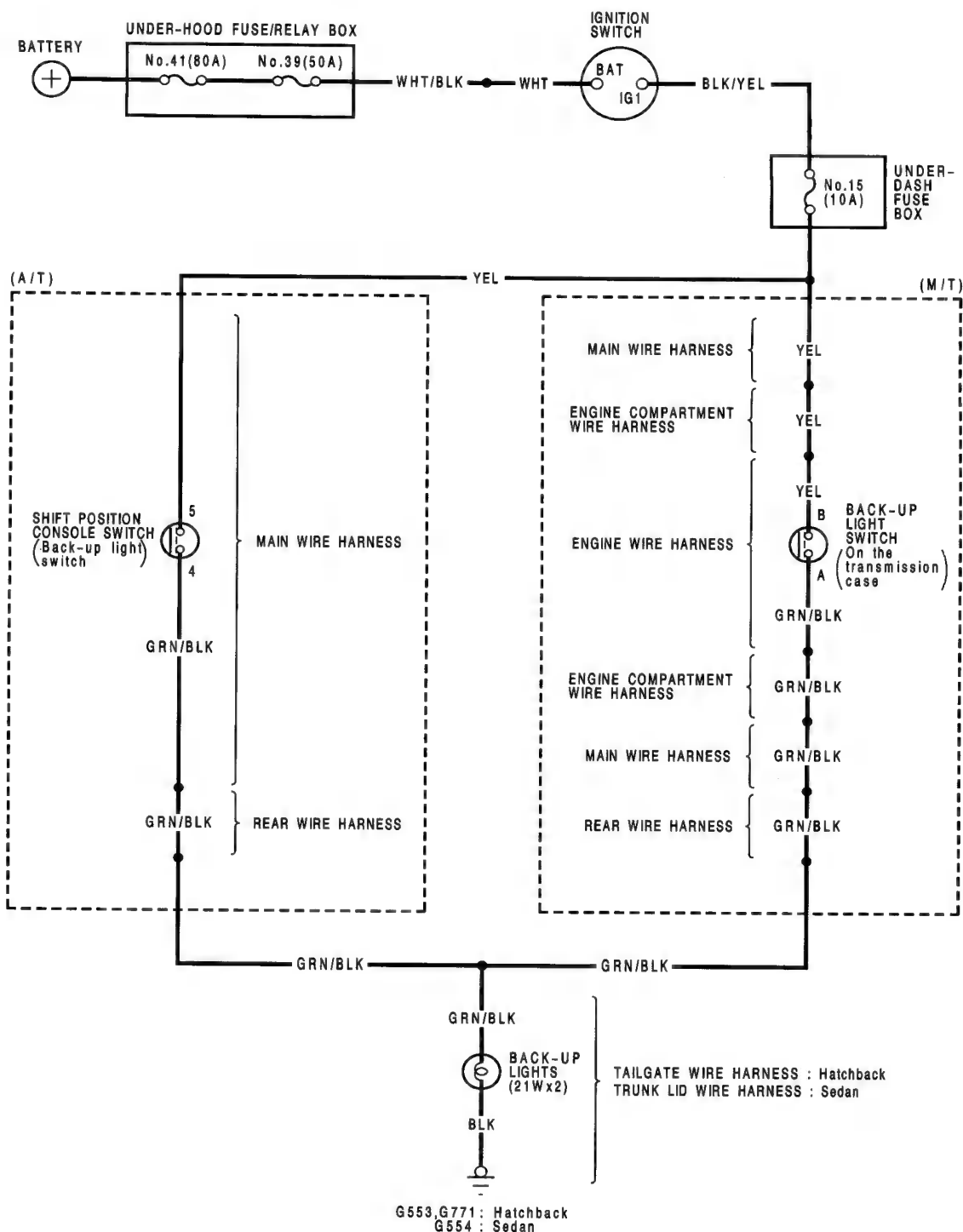


Sedan:



Back-up Lights

Circuit Diagram



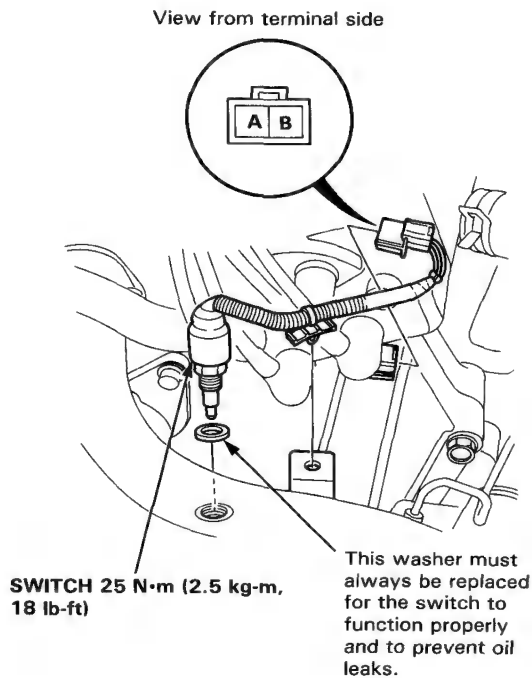


Test

Manual Transmission:

NOTE: Before testing, check the No. 15 (10 A) fuse in the under-dash fuse box.

1. Test the back-up light switch by placing the shift lever in reverse and turning the ignition switch to ON.
2. If the back-up lights do not go on, check the back-up light bulbs in the taillight assembly.
3. If the fuse and bulbs are OK, disconnect the connector from the back-up light switch.

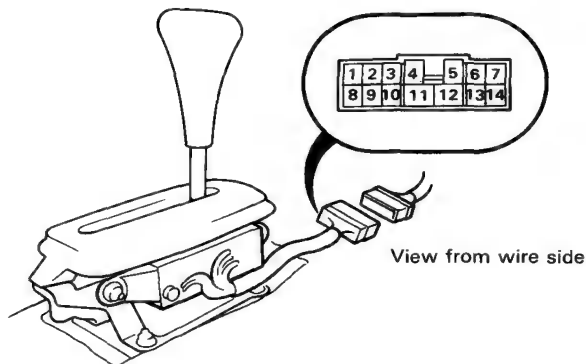


4. Check for continuity between the A and B wires with the switch installed. There should be continuity as the shift lever engages "R".
 - If there is no continuity, replace the switch.
 - If there is continuity, but the back-up lights do not go on, check for:
 - Poor ground, hatchback: G553, G771, sedan: G554.
 - An open in the YEL or GRN/BLK wire.

Automatic Transmission:

NOTE: Check the No. 15 (10 A) fuse in the under-dash fuse box before testing.

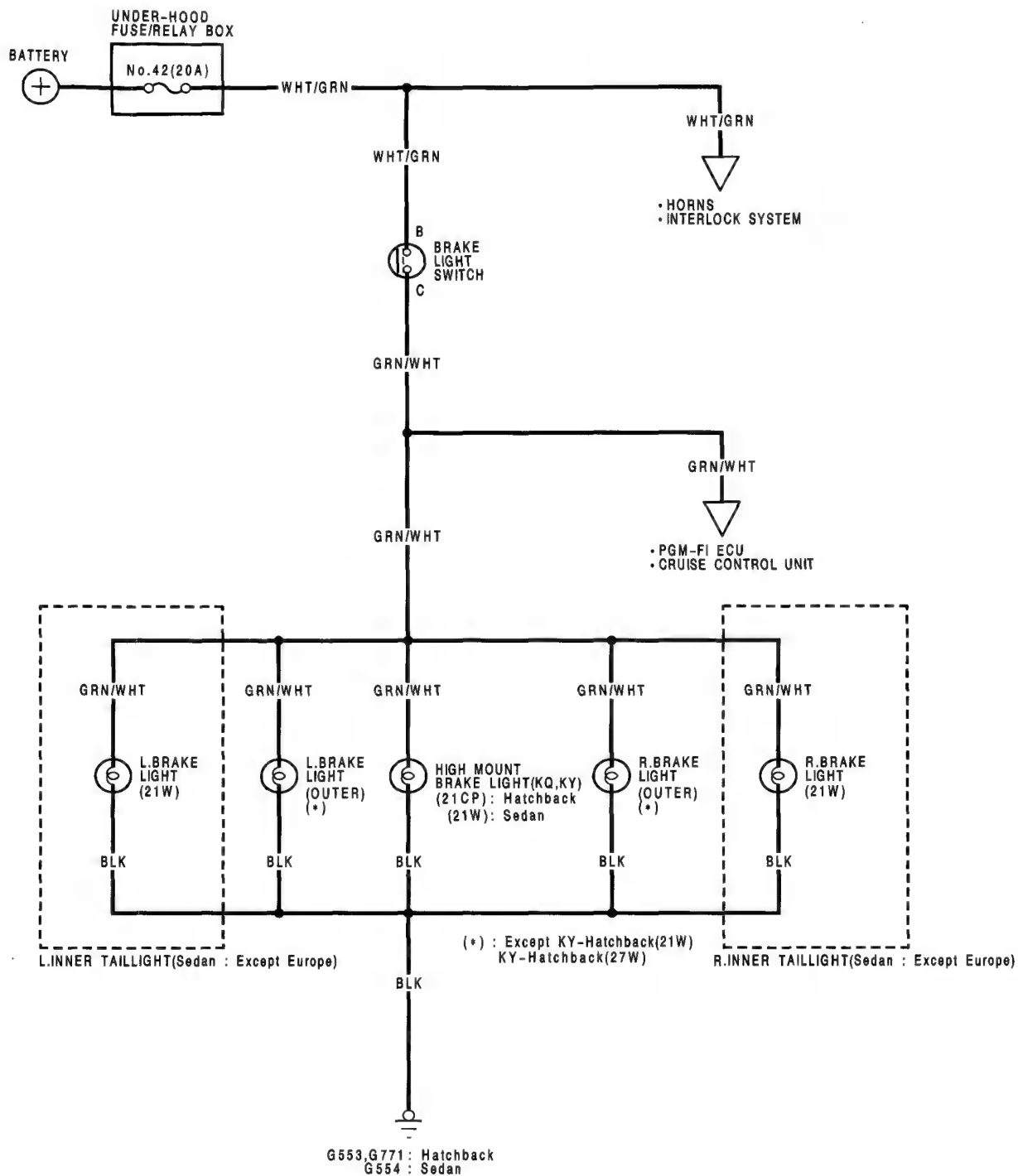
1. Test the back-up light switch by shifting the select lever to "R" and turning the ignition switch ON.
2. If the back-up lights do not go on, check the back-up light bulbs in the taillight assembly.
3. If the fuse and bulbs are OK, disconnect the 14-P connector from the shift position console switch (back-up light switch).



4. Check for continuity between No. 4 and No. 5 terminals. Move the lever back and forth at the "R" position without touching the push button, and check for continuity within the range of free play of the shift lever.
 - If there is no continuity within the range of free play, adjust the position of the shift position console switch (see Section 14).
 - If there is continuity, but the back-up lights do not go on, check for:
 - Poor ground, hatchback: G553, G771, sedan: G554.
 - An open in the YEL or GRN/BLK wire.

Brake Lights

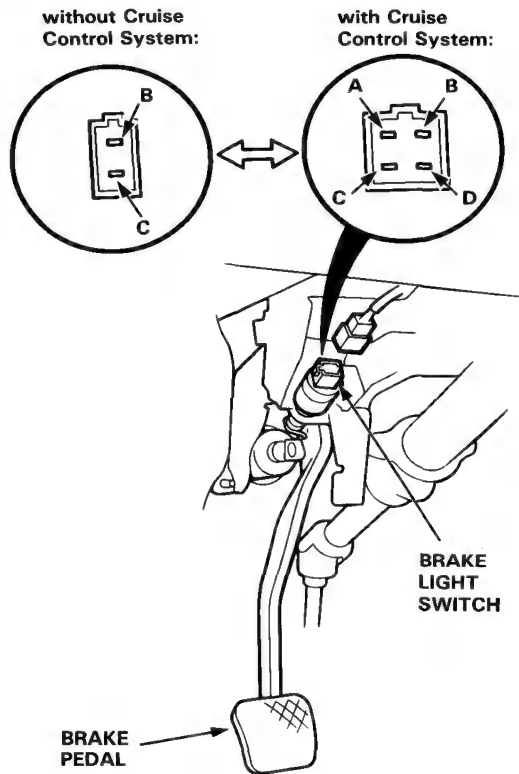
Circuit Diagram





Brake Light Switch Test

1. If the brake lights do not go on, check the No. 42 (20 A) fuse in the under-hood fuse/relay box, and the brake light bulbs in the taillight assembly and the high mount brake light.
2. If the fuse and bulbs are OK, disconnect the 2-P or 4-P connector from the brake light switch.

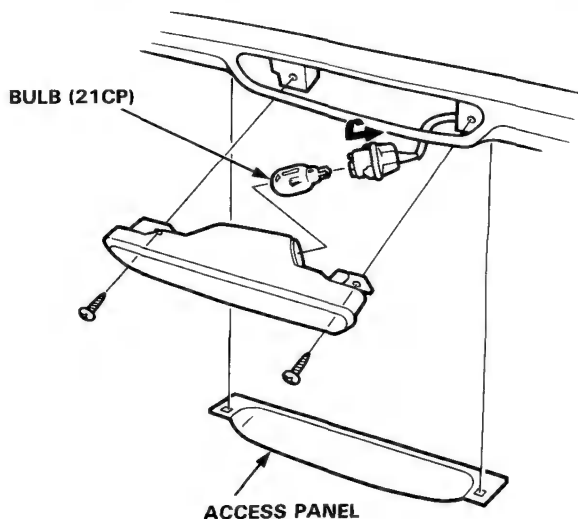


3. Check for continuity between the B and C terminals. There should be continuity with the brake pedal pushed.
 - If there is no continuity, replace the switch or adjust pedal height (see Section 19).
 - If there is continuity, but the brake lights do not go on, inspect for:
 - Poor ground, hatchback: G553, G771, sedan: G554.
 - An open in the WHT/GRN or GRN/WHT wire.

High Mount Brake Light Replacement (KQ, KY)

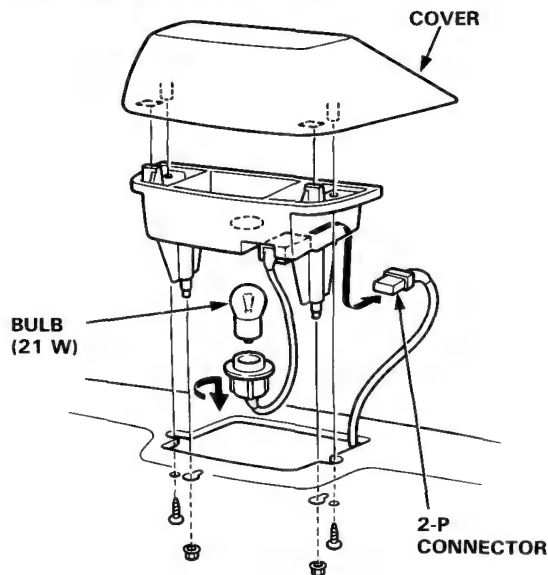
Hatchback:

1. Remove the access panel and 2 screws, then pull out the high mount brake light.



Sedan:

1. Open the trunk lid and disconnect the 2-P connector and 2 screws from the high mount brake light.
2. Remove the 2 nuts, then remove the high mount brake light from the rear shelf.



3. Install the high mount brake light in the reverse order of removal. Clean the rear window glass before installing the light.

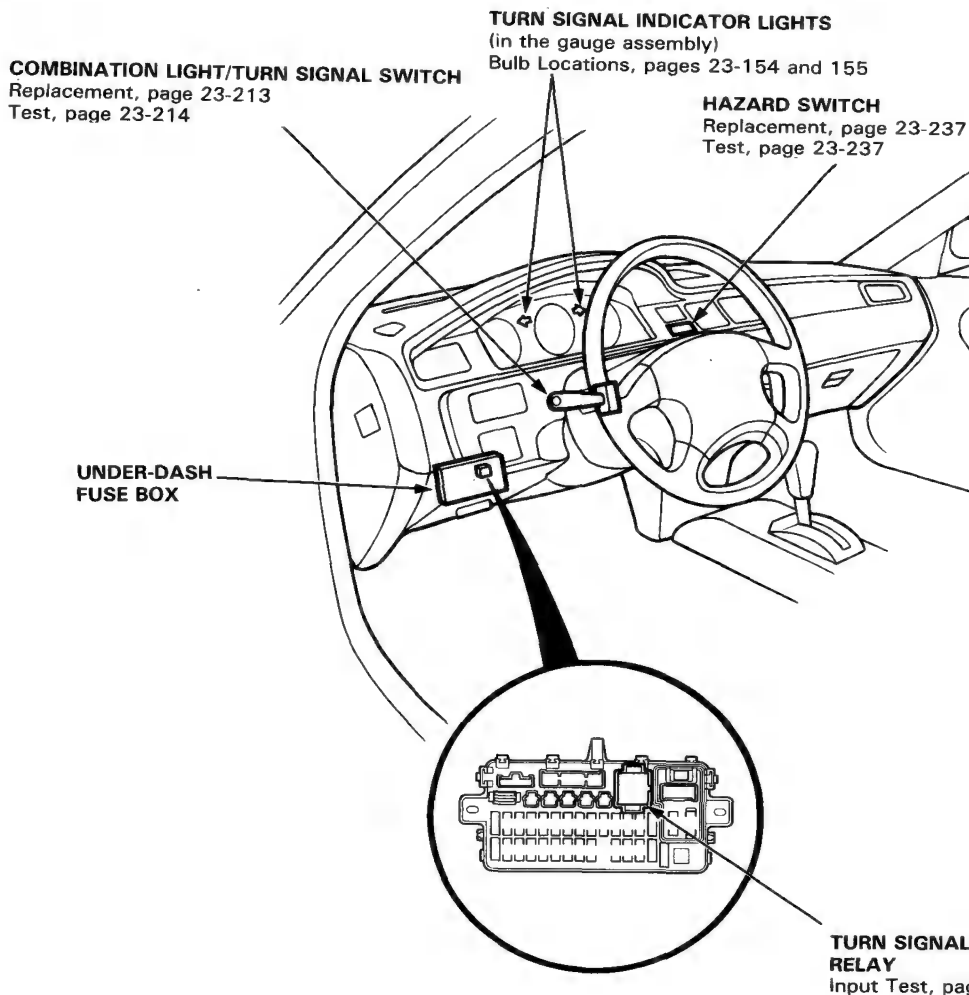
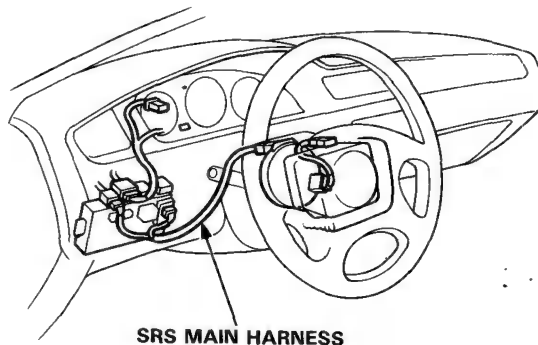
Turn Signal/Hazard Flasher System

Component Location Index

CAUTION (with SRS):

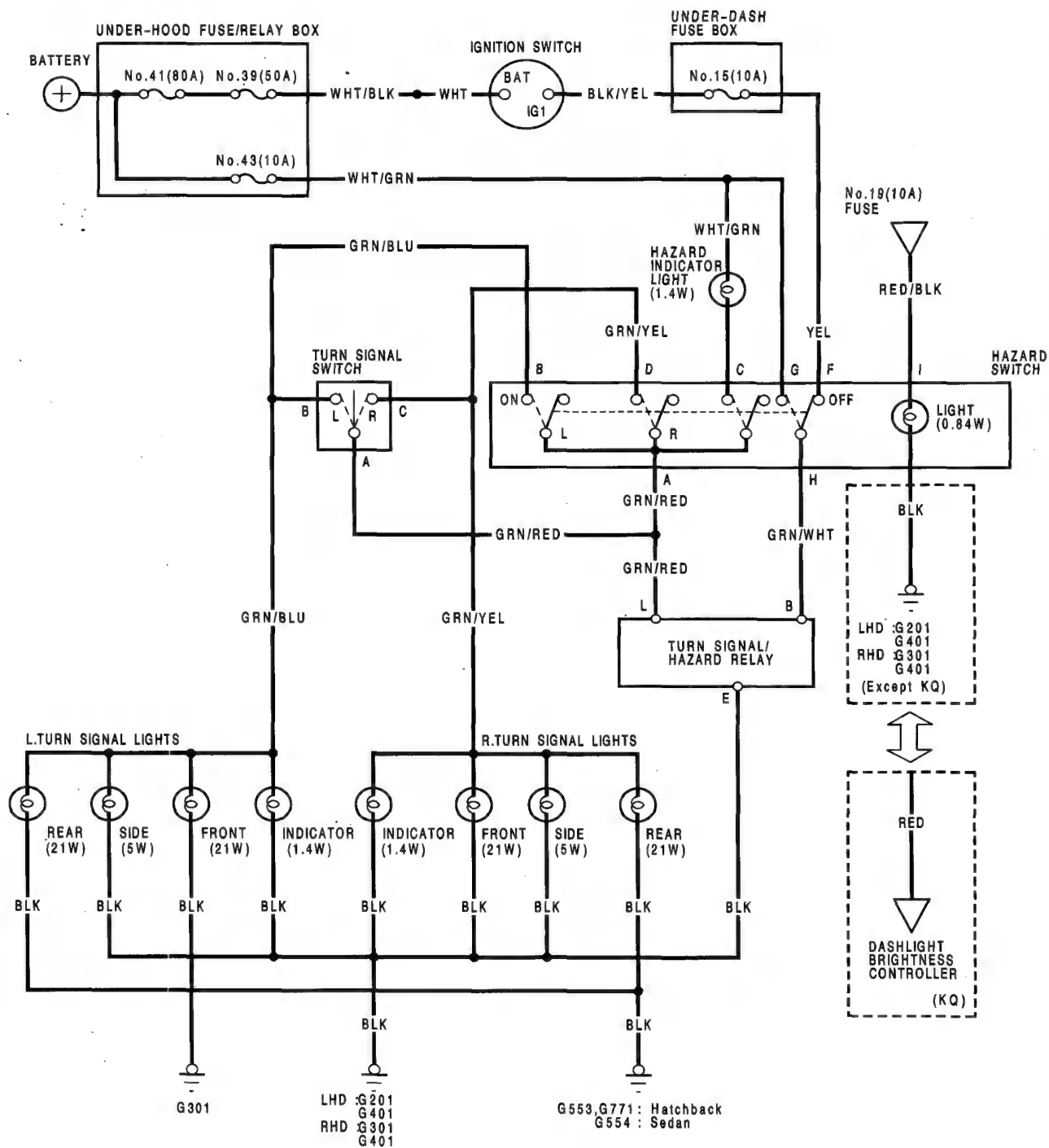
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown; RHD type is symmetrical.





Circuit Diagram



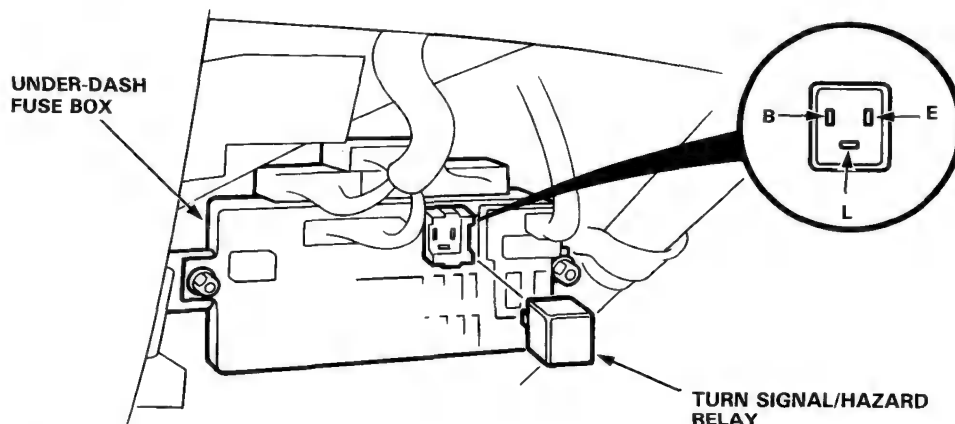
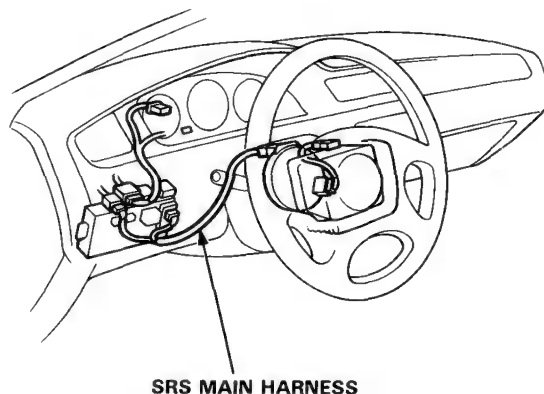
Turn Signal/Hazard Flasher System

Turn Signal/Hazard Relay Input Test

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

1. Remove the turn signal/hazard relay from the under-dash fuse box.
2. Make the following input tests at the relay holder terminals.
3. If all tests prove OK, but the relay fails to work, replace the turn signal/hazard relay.



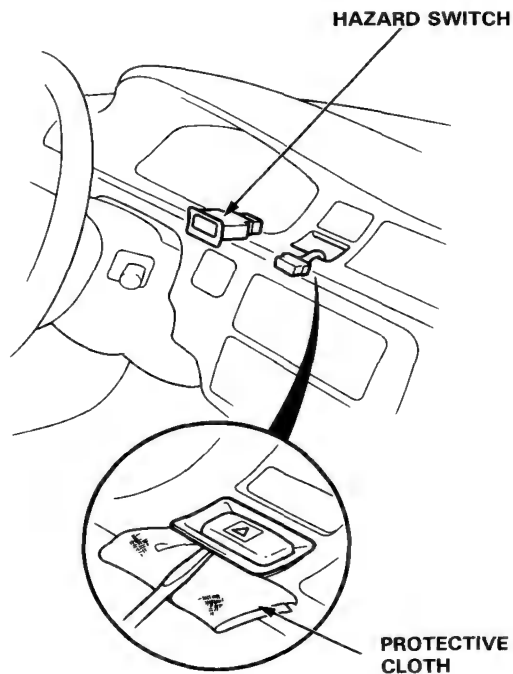
No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	E	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G301, G401). • An open in the BLK wire.
2	B	Ignition switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 15 (10 A) fuse. • An open in the YEL or GRN/WHT wire. • Faulty hazard switch.
		Hazard switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 43 (10 A) fuse. • An open in the WHT/GRN or GRN/WHT wire. • Faulty hazard switch.
3	L	Hazard switch ON and connect the B terminal to the L terminal.	Hazard lights should come on.	<ul style="list-style-type: none"> • Poor ground (G201, G301, G401, G553, G554, G771). • Faulty hazard switch. • An open in the GRN/RED, GRN/YEL, GRN/BLU or BLK wire.
		Ignition switch ON and turn signal switch in R or L and connect the B terminal to the L terminal.	R or L turn signal lights should come on.	<ul style="list-style-type: none"> • Poor ground (G201, G301, G401). • Faulty turn signal switch.



Hazard Switch Replacement

CAUTION: Be careful not to damage the instrument panel.

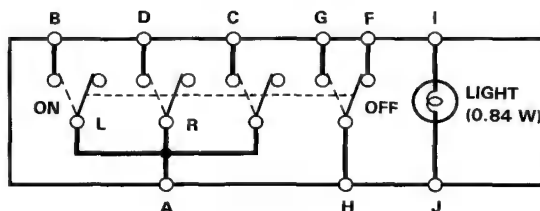
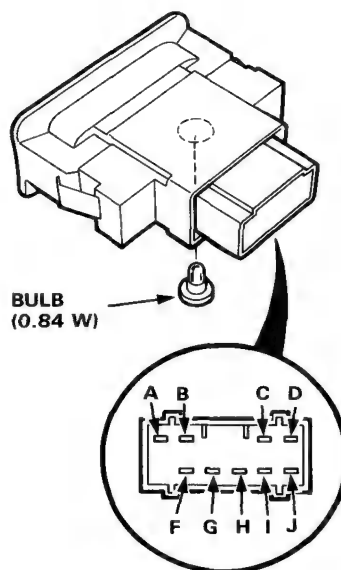
1. Carefully pry the hazard switch out of the instrument panel.



Hazard Switch Test

1. Carefully pry the hazard switch out of the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B	C	D	F	G	H	I	J
Position									
OFF					○	—	○	○	○
ON	○	○	○	○			○	○	○

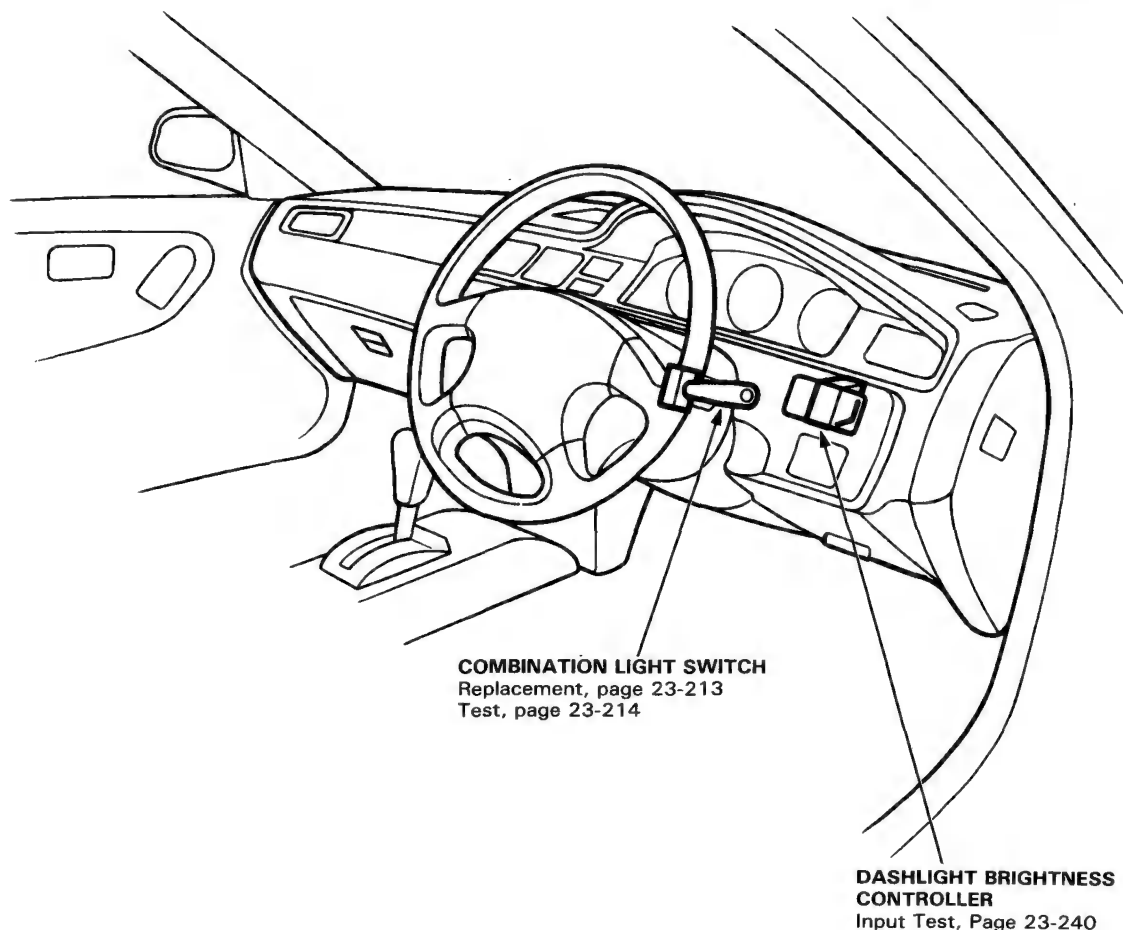
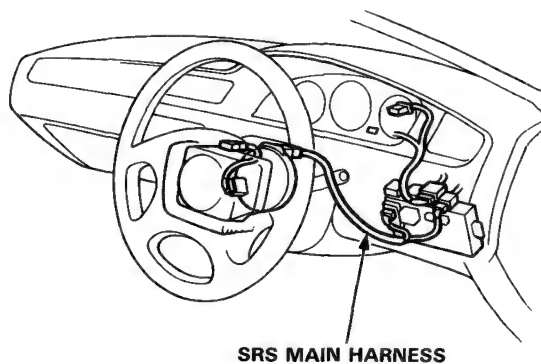


Dashlight Brightness Controller (KQ)

Component Location Index

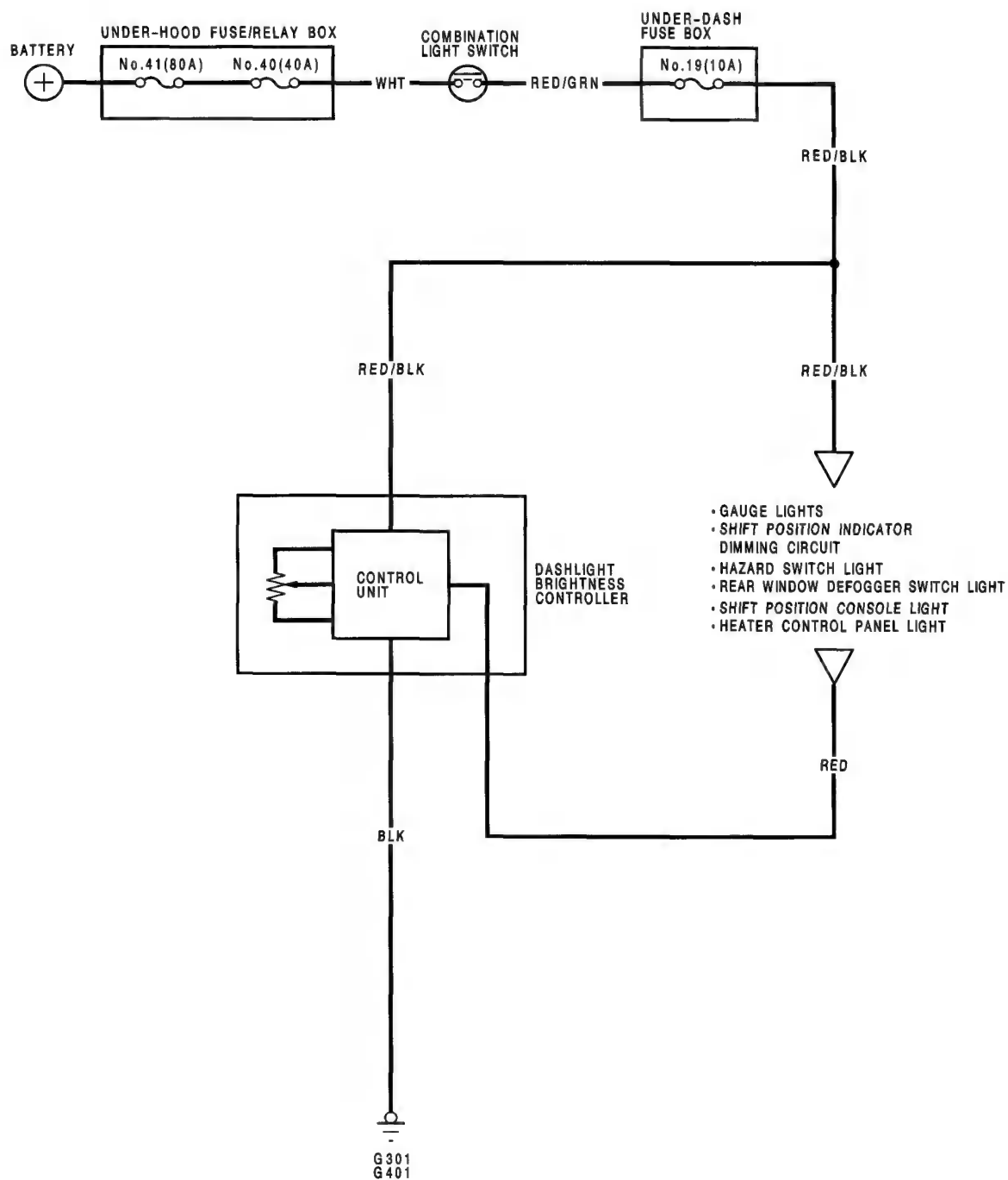
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.





Circuit Diagram (KQ)

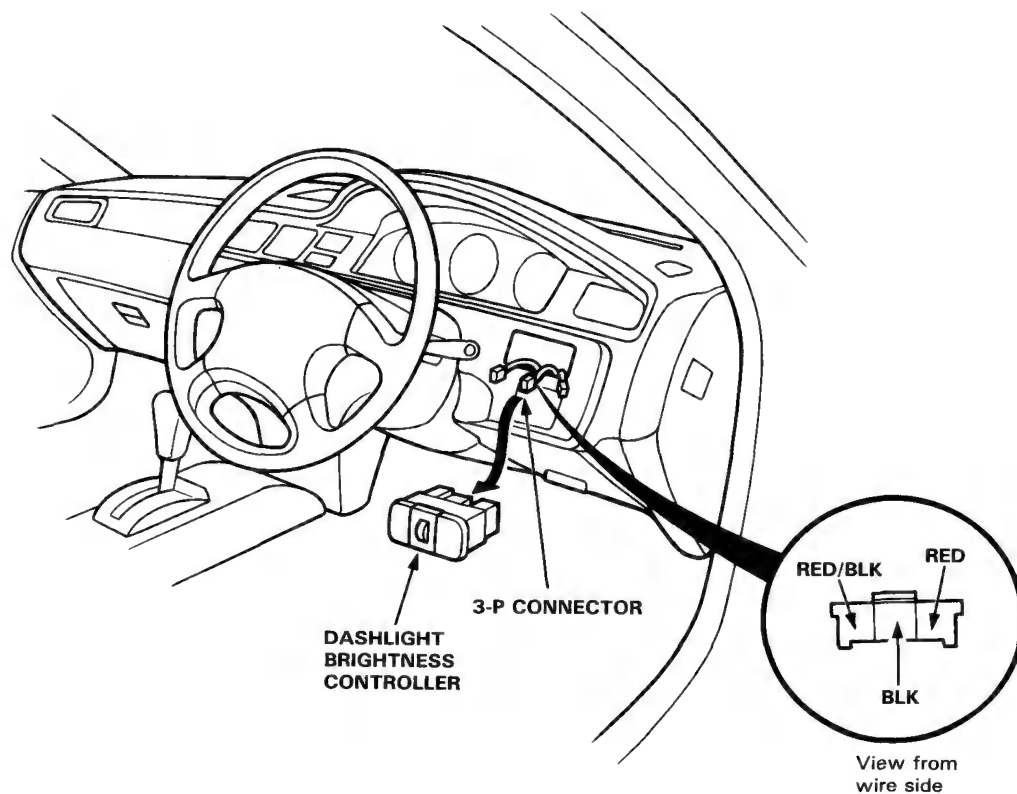


Dashlight Brightness Controller (KQ)

Controller Input Test

NOTE: The control unit is built into the dashlight brightness controller.

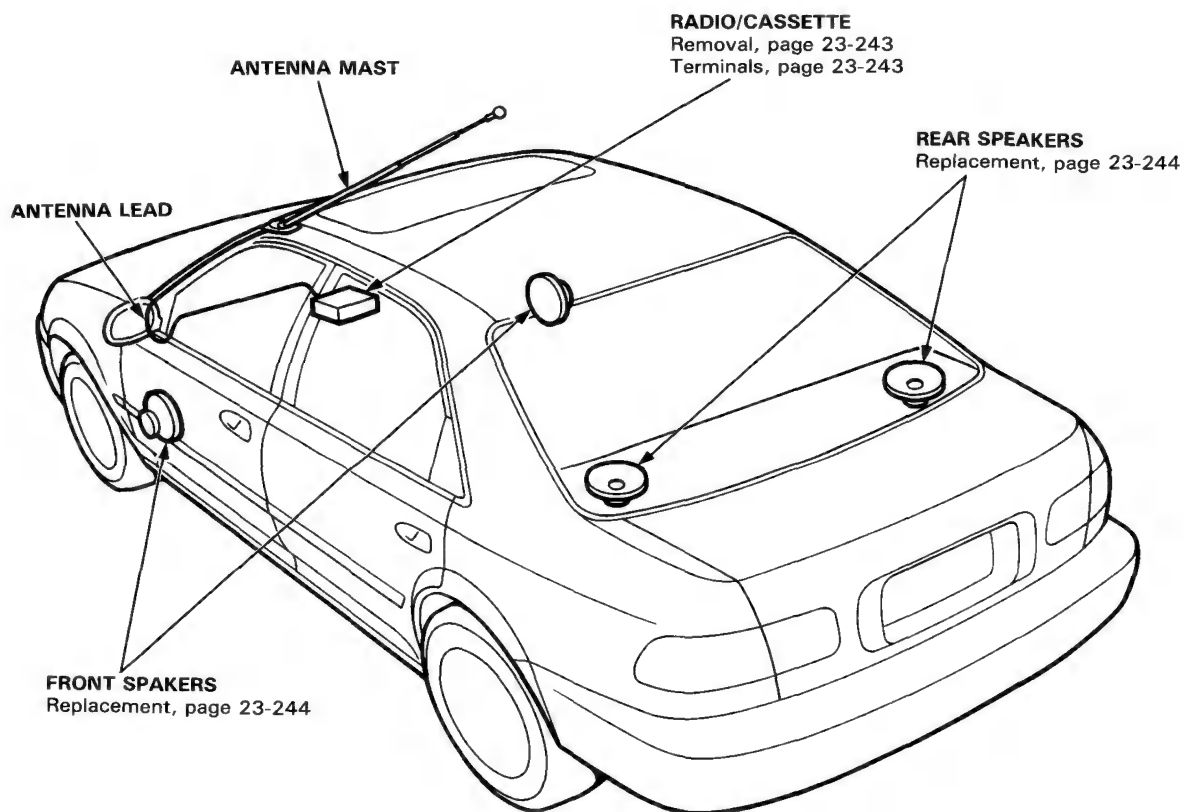
1. Carefully pry the switches out of the dashboard, then disconnect the 3-P connector from the controller.
2. Make the following input tests at the connector terminals.
3. If all tests prove OK, yet the dashlights still cannot be controlled, check the connector for good contact. If OK, replace the controller.



No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none">• Poor ground (G301, G401).• An open in the wire.
2	RED/BLK	Combination light switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none">• Blown No. 19 (10 A) fuse.• Faulty combination light switch.• An open in the wire.
3	RED	Combination light switch ON.	Connect to ground: dashlights should come on full bright.	<ul style="list-style-type: none">• An open in the RED/BLK or RED wire.

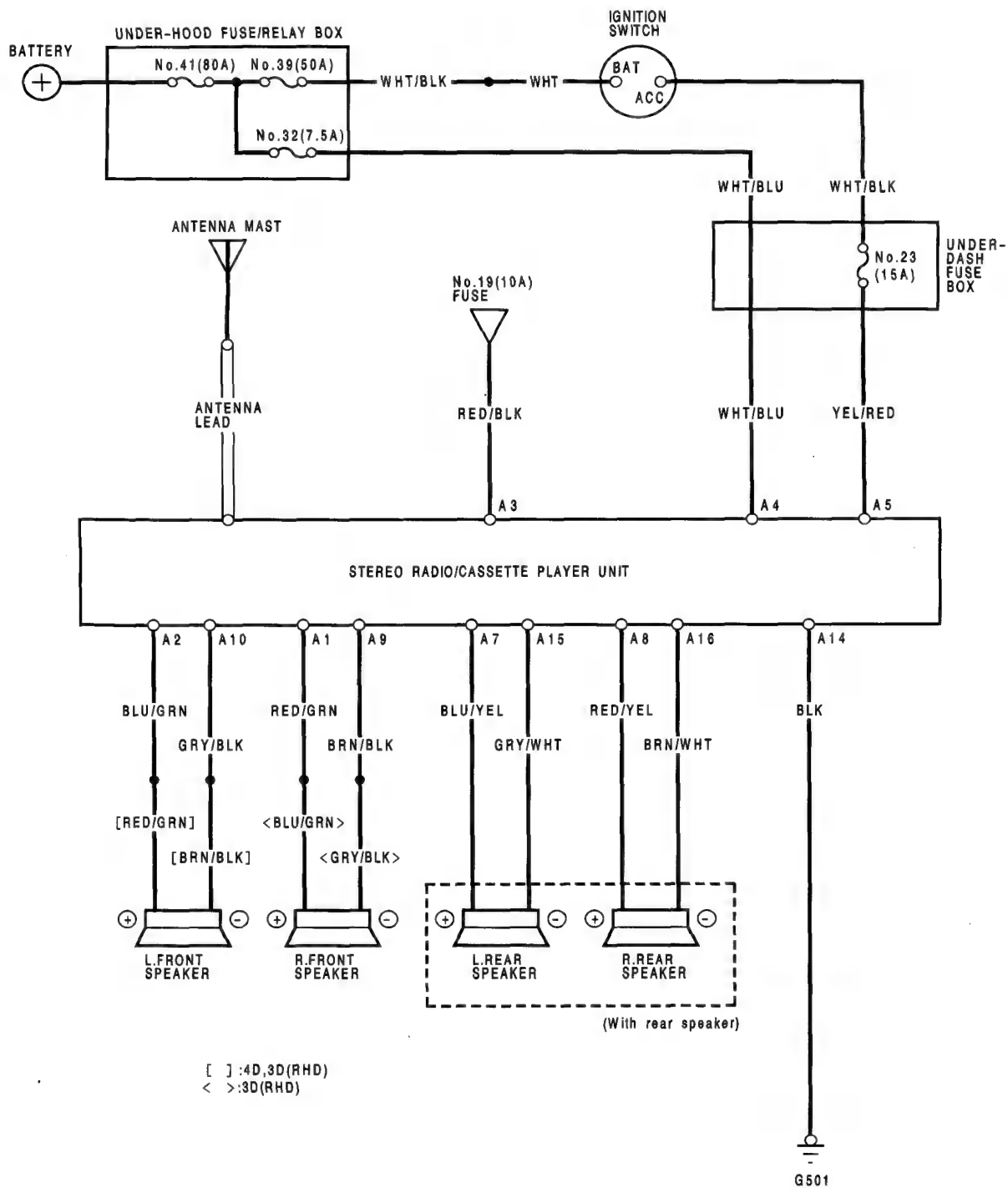
Stereo Sound System

Component Location Index



Stereo Sound System

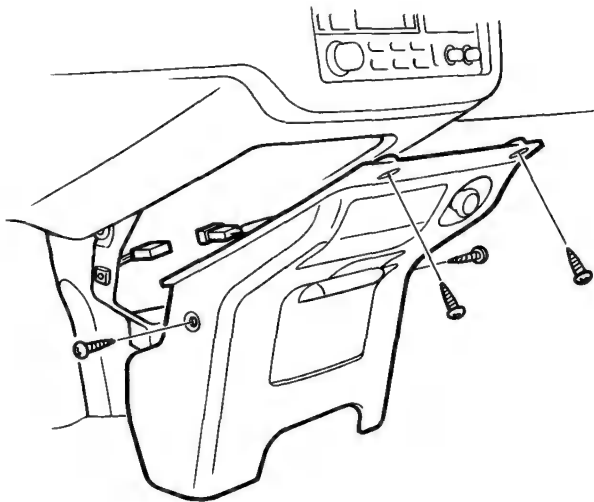
Circuit Diagram



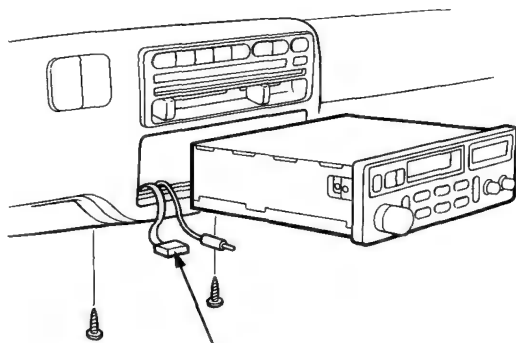


Radio/Cassette Unit Removal

1. Remove the center instrument panel, then disconnect the 4-P connector from the cigarette lighter.

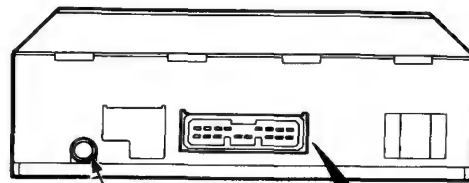


2. Remove the 2 screws, then disconnect the 16-P connector and the antenna lead, and pull out the radio/cassette unit.

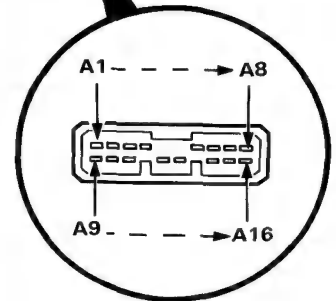


16-P CONNECTOR

Radio/Cassette Unit Terminals



For ANTENNA LEAD



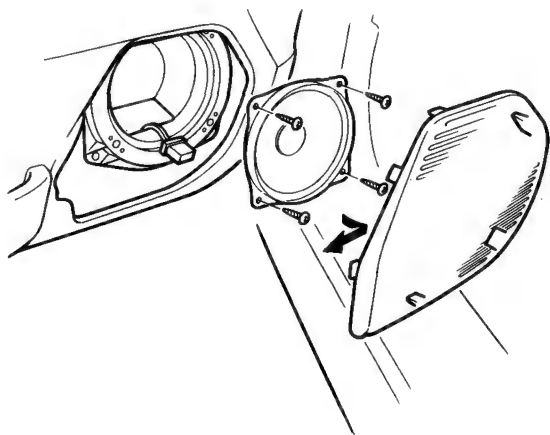
Terminal	Wire	Destination
A1	RED/GRN	Right front speaker ⊕
A2	BLU/GRN	Left front speaker ⊕
A3	RED/BLK	Light-on signal
A4	WHT/BLU	Constant power (Tuning memory)
A5	YEL/RED	ACC (Main stereo power supply)
A6		(not used)
A7	BLU/YEL	Left rear speaker ⊕
A8	RED/YEL	Right rear speaker ⊕
A9	BRN/BLK	Right front speaker ⊖
A10	GRY/BLK	Left front speaker ⊖
A11		(not used)
A12		(not used)
A13		(not used)
A14	BLK	Ground (G501)
A15	GRY/WHT	Left rear speaker ⊖
A16	BRN/WHT	Right rear speaker ⊖

Terminal	Wire	Destination
A1	RED/GRN	Right front speaker ⊕
A2	BLU/GRN	Left front speaker ⊕
A3	RED/BLK	Light-on signal
A4	WHT/BLU	Constant power (Tuning memory)
A5	YEL/RED	ACC (Main stereo power supply)
A6		(not used)
A7	BLU/YEL	Left rear speaker ⊕
A8	RED/YEL	Right rear speaker ⊕
A9	BRN/BLK	Right front speaker ⊖
A10	GRY/BLK	Left front speaker ⊖
A11		(not used)
A12		(not used)
A13		(not used)
A14	BLK	Ground (G501)
A15	GRY/WHT	Left rear speaker ⊖
A16	BRN/WHT	Right rear speaker ⊖

Stereo Sound System

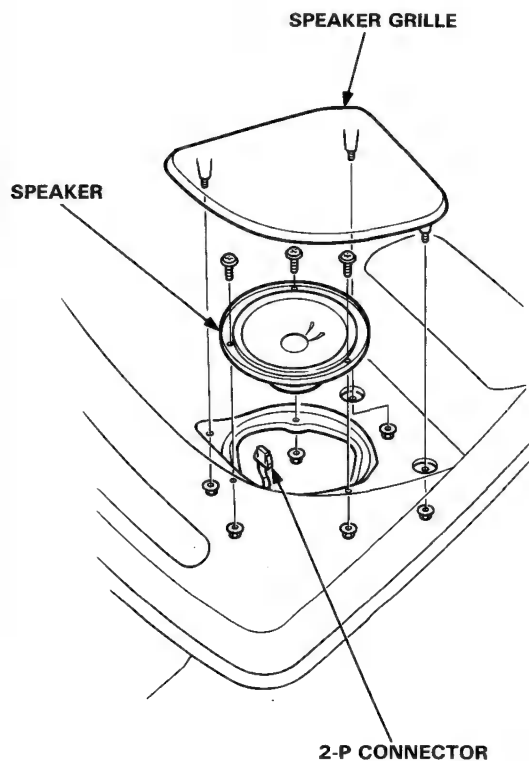
Front Speaker Replacement

1. Carefully pry out the speaker grille.
2. Remove the 4 screws, then disconnect the 2-P connector from the speaker and remove the speaker.



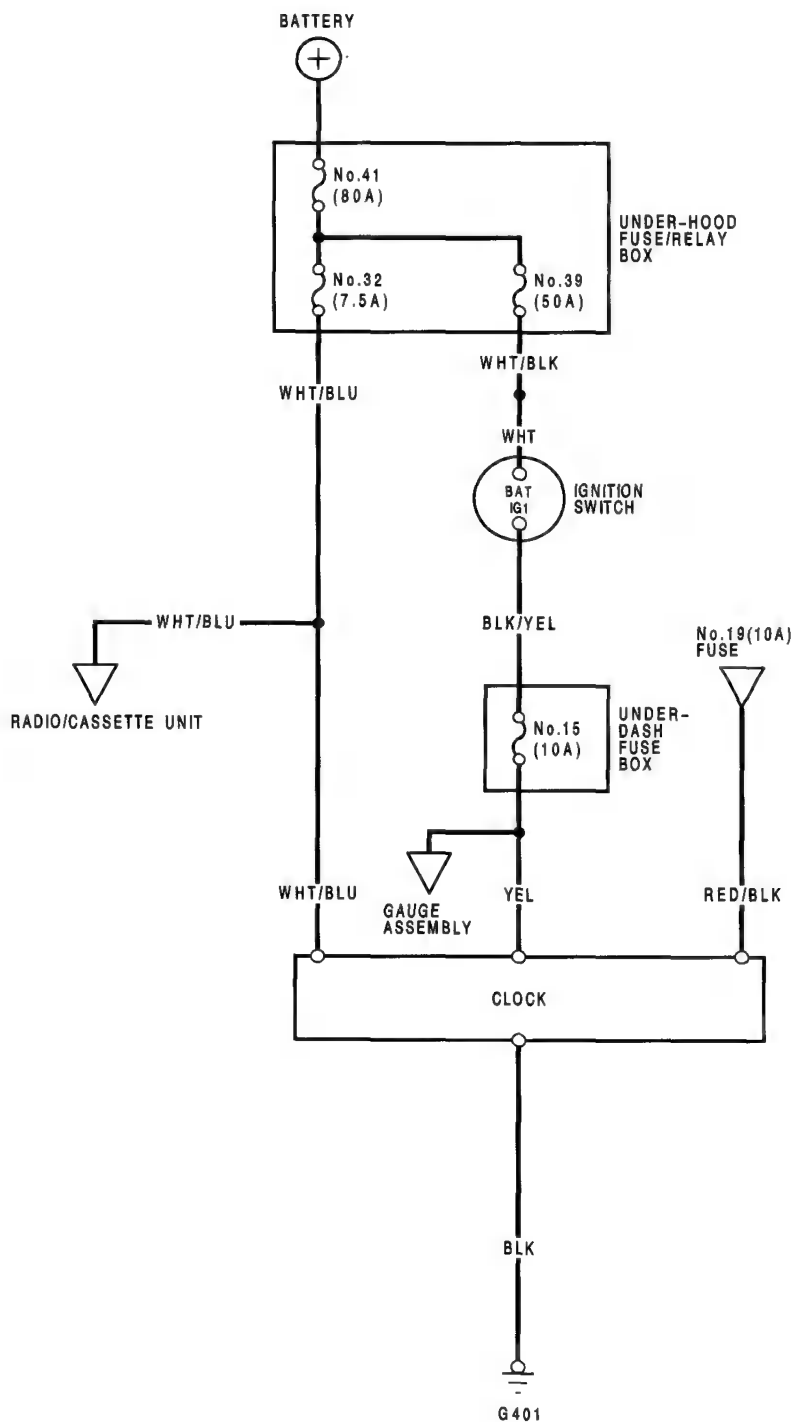
Rear Speaker Replacement

1. Remove the 3 nuts from the trunk side, then remove the speaker grille.
2. Remove the 3 nuts, then disconnect the 2-P connector from the speaker and remove the speaker.



Clock

Circuit Diagram

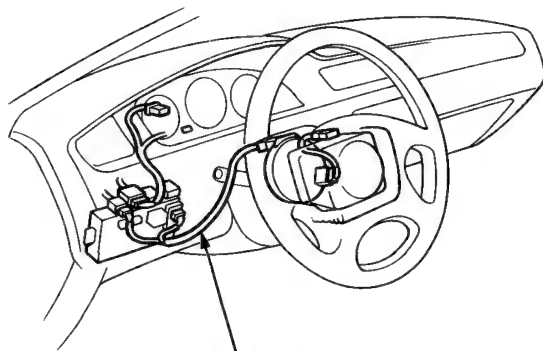


Clock

Replacement

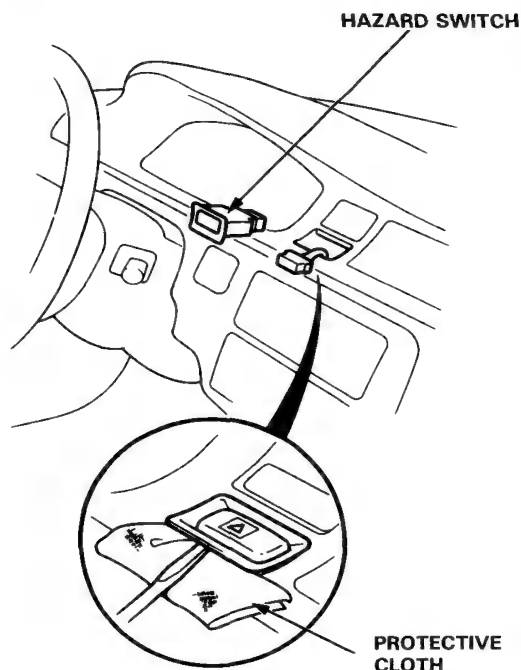
CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



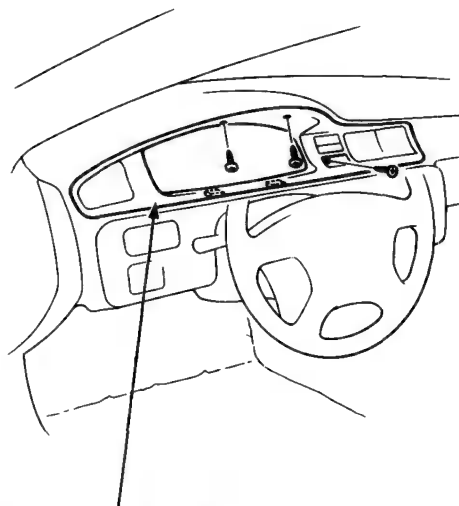
SRS MAIN HARNESS

1. Carefully pry the hazard switch out of the instrument panel.



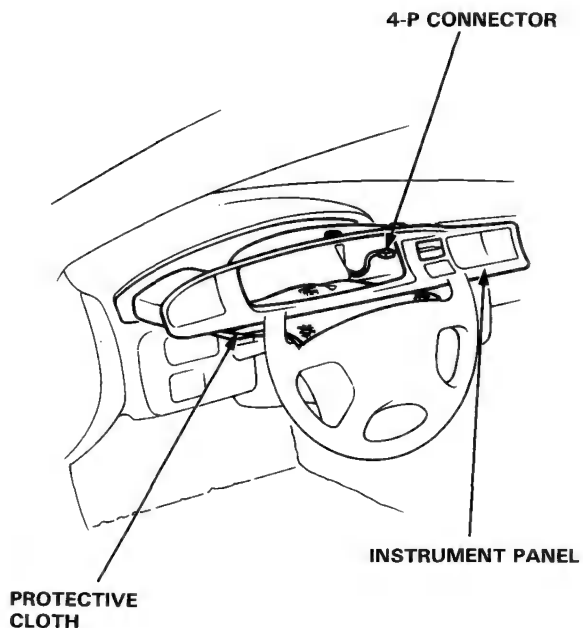
PROTECTIVE CLOTH

2. Remove the 3 screws, then remove the instrument panel from the dashboard.



INSTRUMENT PANEL

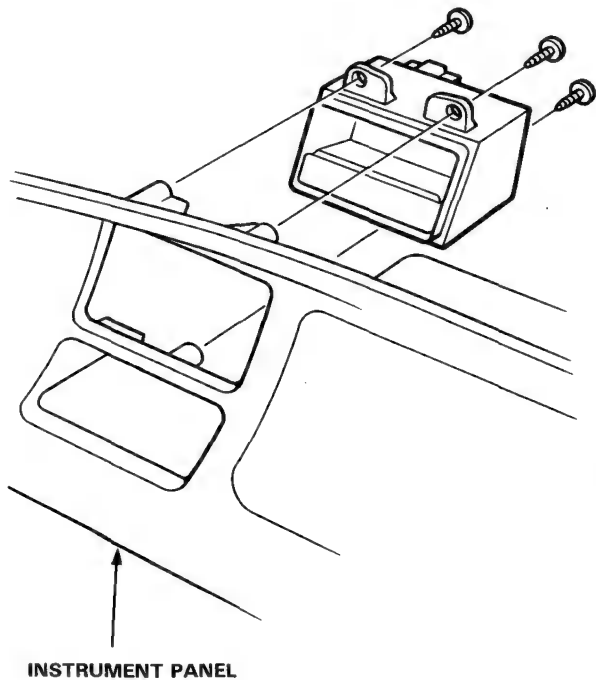
3. Disconnect the 4-P connector from the instrument panel.



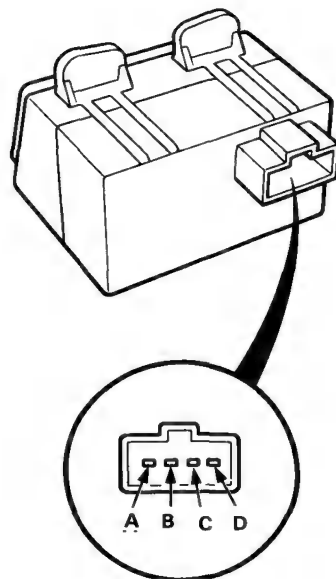
PROTECTIVE CLOTH



4. Remove the clock from the instrument panel.



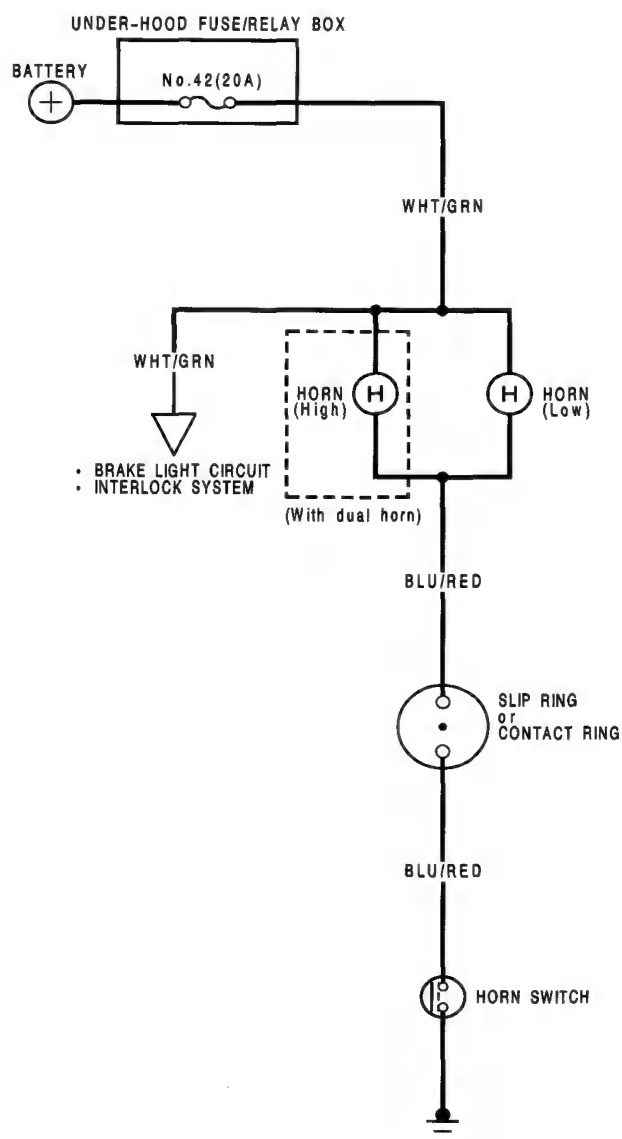
Terminals



Terminal	Wire	Destination
A	WHT/BLU	Constant power (Time memory)
B	RED/BLK	Light-on signal
C	YEL	IG1 (Main clock power supply)
D	BLK	Ground

Horns

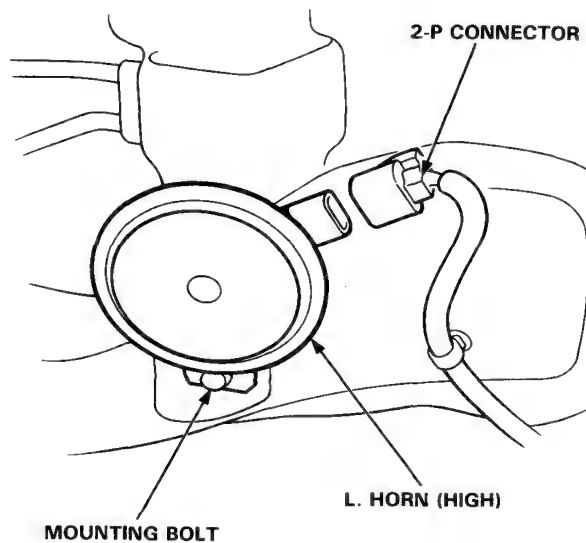
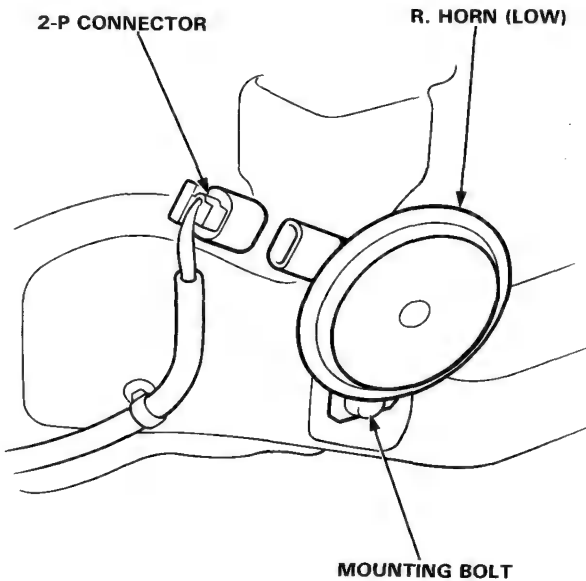
Circuit Diagram



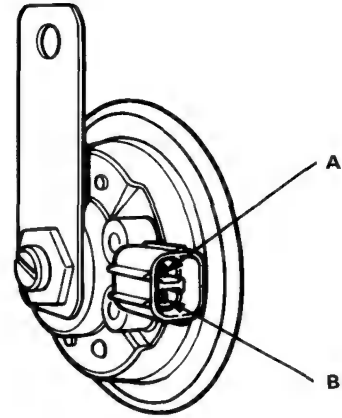


Horn Test

1. Remove the front bumper.
2. Disconnect the 2-P connector from the horn.
3. Remove the low and high horns.



4. Test the horn by connecting battery power to one terminal and grounding the other. The horn should sound.



5. Replace the horn if it fails to sound.

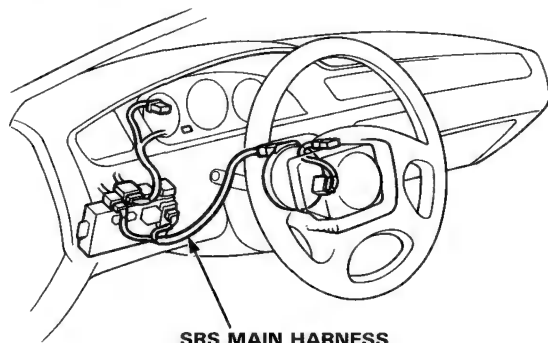
Horns

Switch Test (With SRS)

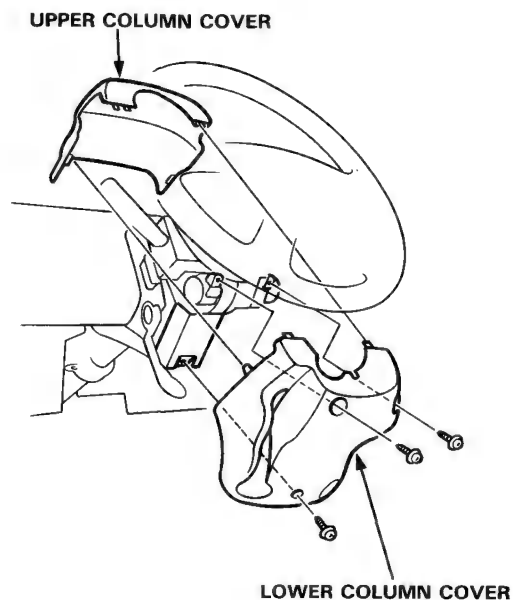
⚠ WARNING Store a removed airbag assembly with the pad surface up. If the air bag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION (with SRS):

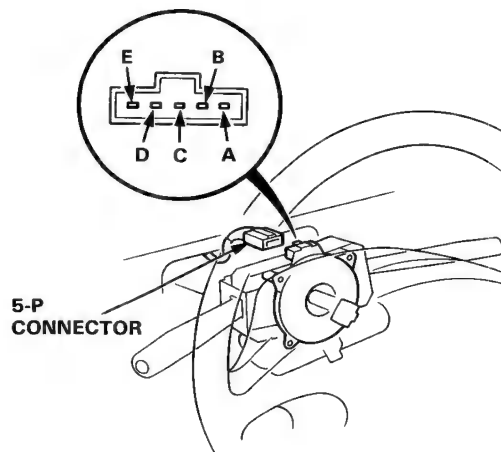
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



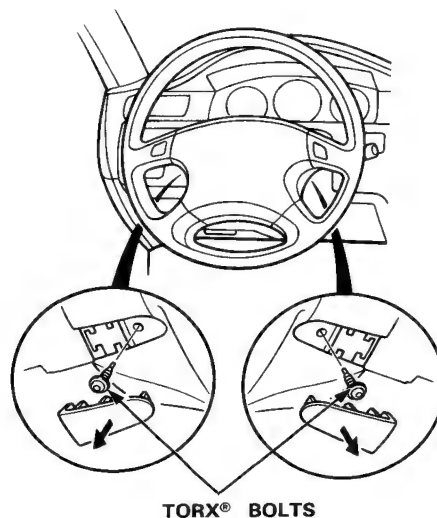
1. Remove the dashboard lower cover (see page 23-72).
2. Remove the steering column covers (see page 23-75).



3. Disconnect the 5-P connector from the slip ring.
4. Check for continuity between the C terminal and body ground with the horn switch pressed. There should be continuity.
 - If there is continuity, the horn switch is OK.
 - If there is no continuity in any of the positions, replace the horn switch.
 - If there is no continuity in all positions, go to step 5.

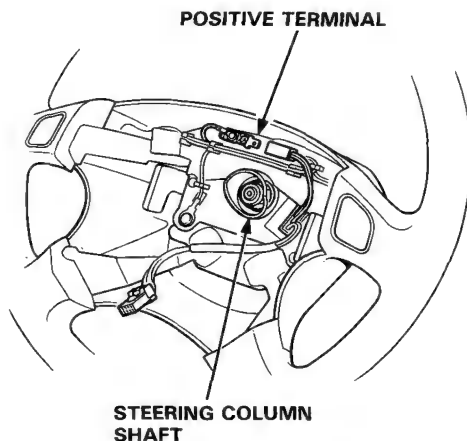


5. Remove the 2 TORX® bolts using a TORX® T30 bit, then remove the airbag assembly.





10. Check for continuity between the horn positive terminal and the steering column shaft with the horn switch pressed. There should be continuity.



- If there is continuity, check for:
 - Faulty slip ring (see page 23-325).
 - An open in the BLU/RED wire between the positive terminal and slip ring.
- If there is no continuity, remove the nut and the 4 screws, then remove the steering wheel cover. Replace the horn switch.

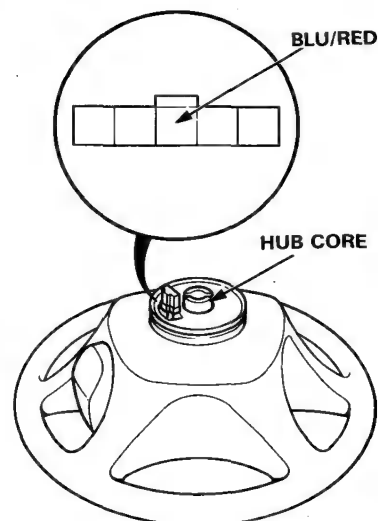
11. Reinstall the steering wheel (see Section 17).

Switch Test (Without SRS)

1. Remove the steering wheel, then turn it over.
2. Check for continuity between the hub core and the contact ring, or the hub core and the BLU/RED lead for cars equipped with cruise control, according to the table.

With Cruise Control:

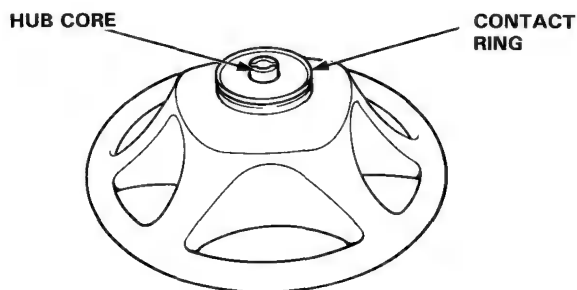
Terminal Position	HUB CORE	BLU/RED
PRESS	○	○
FREE		



- If there is continuity, test the slip ring (see page 23-325).

Without Cruise Control:

Terminal Position	HUB CORE	CONTACT RING
PRESS	○	○
FREE		



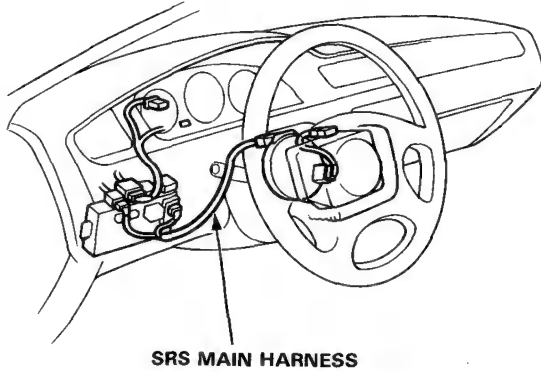
- If there is continuity, test the combination switch.

Cigarette Lighter

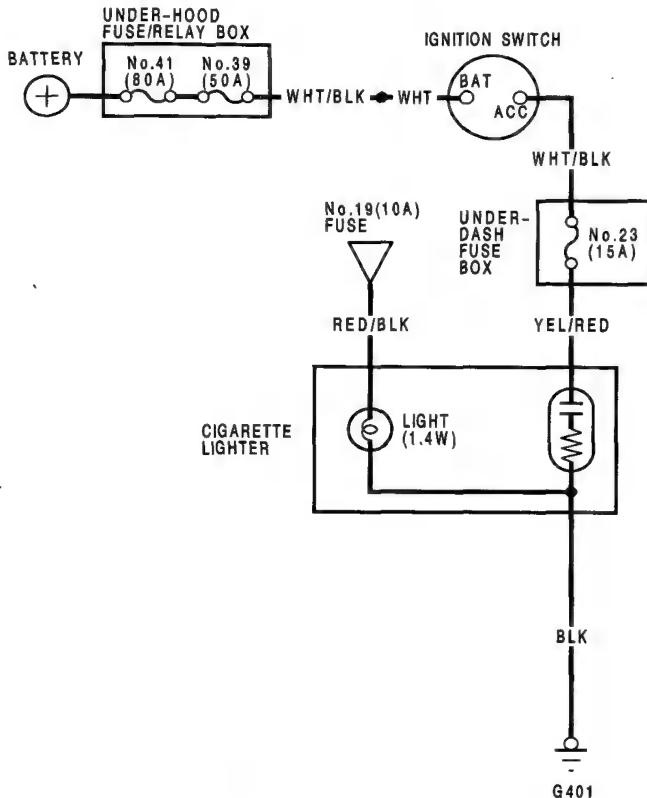
Replacement

CAUTION (with SRS):

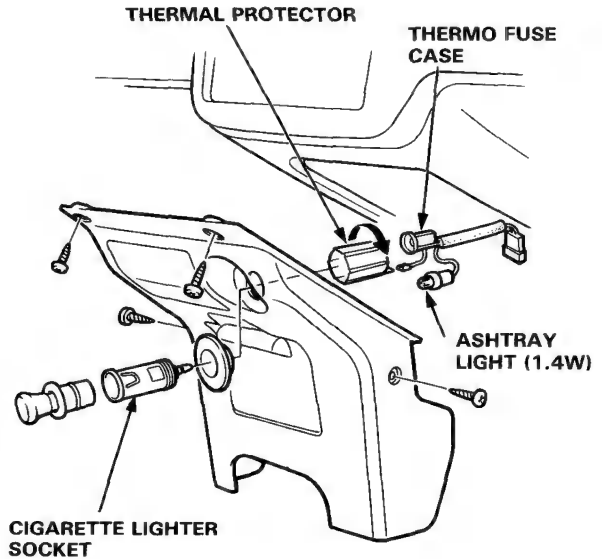
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



Cigarette Lighter Circuit:



1. Remove the 4 screws and the center instrument panel, then disconnect the 4-P connector from the cigarette lighter.
2. Disconnect the thermofuse case from the socket end.
3. Remove the thermal protector and separate the cigarette lighter socket.



4. When installing the cigarette lighter, align the lug on the cigarette lighter socket with the slot in the panel.
5. Make sure that the ground wire and thermofuse case are seated to the cigarette lighter assembly.

Sunroof



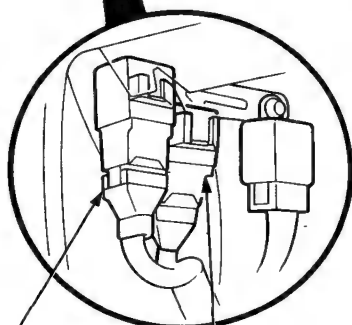
Component Location Index

NOTE: LHD type is shown; RHD type is symmetrical.

SUNROOF SWITCH
Removal, page 23-257
Test, page 23-258

(Sedan)

**OPEN/CLOSE-
TILT/CLOSE SWITCH**
Test, page 23-259



SUNROOF OPEN RELAY
(Wire colors: GRN/BLK, YEL,
WHT, GRN/RED, and BLK)
Test, page 23-71

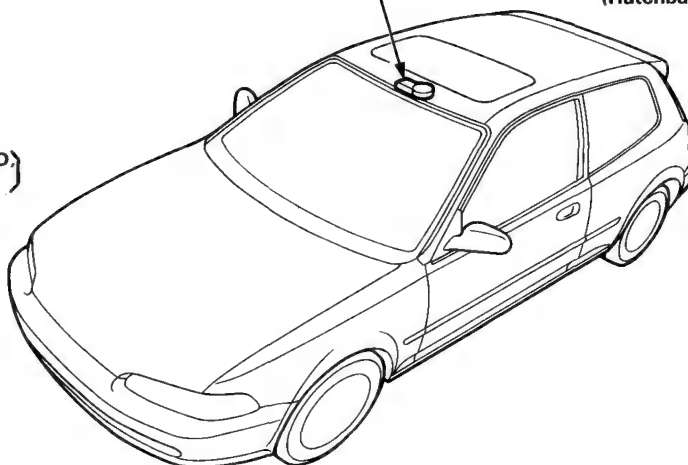
SUNROOF CLOSE RELAY

SUNROOF MOTOR
Test, page 23-260
Replacement, section 20

(Hatchback)

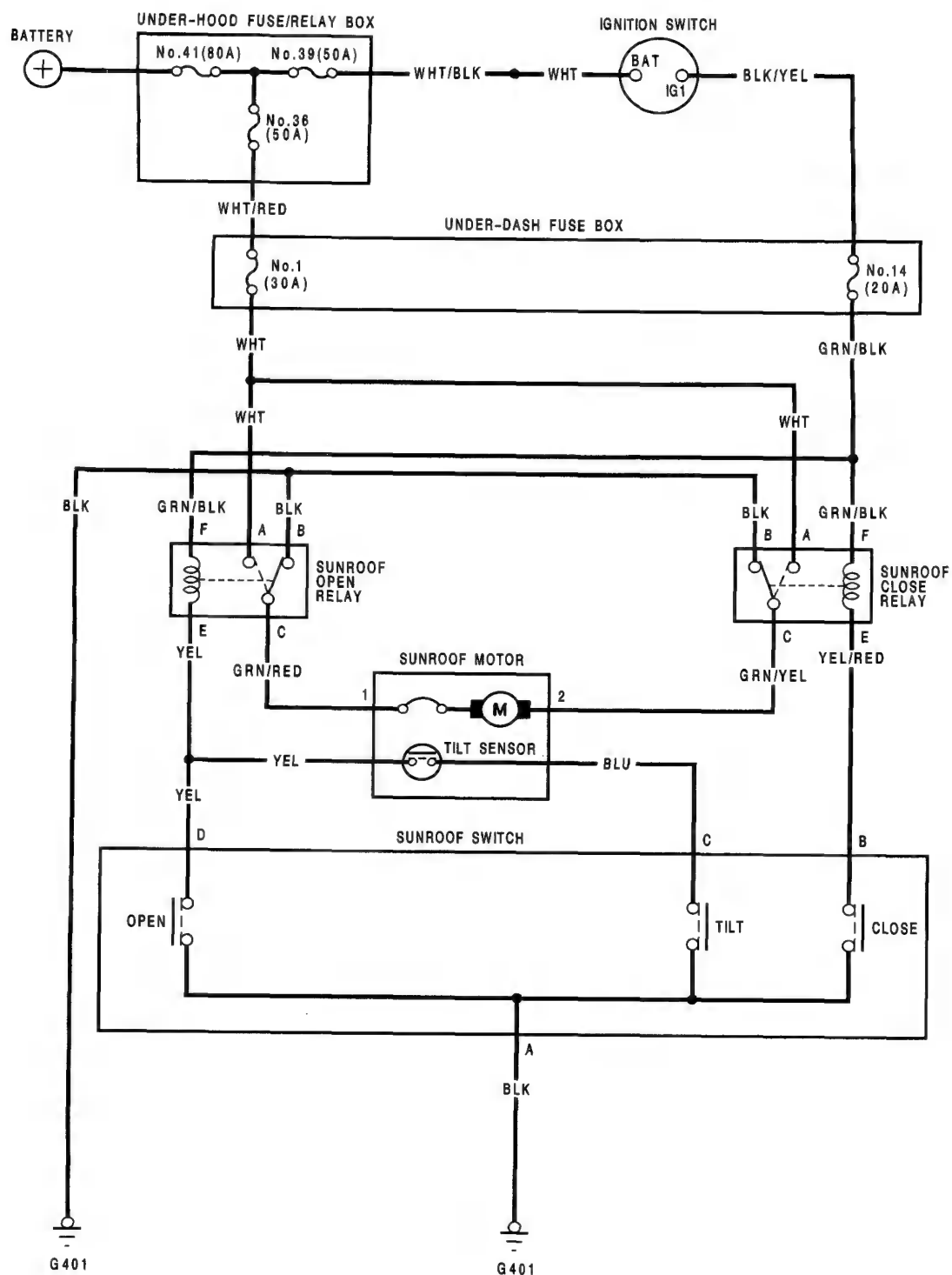
Sedan: (Wire colors: GRN/BLK, YEL/RED,
WHT, GRN/YEL, and BLK)

Hatchback: (Wire colors: GRN/BLK, GRN/RED,
WHT, GRN/YEL, and BLK)
Test, page 23-71



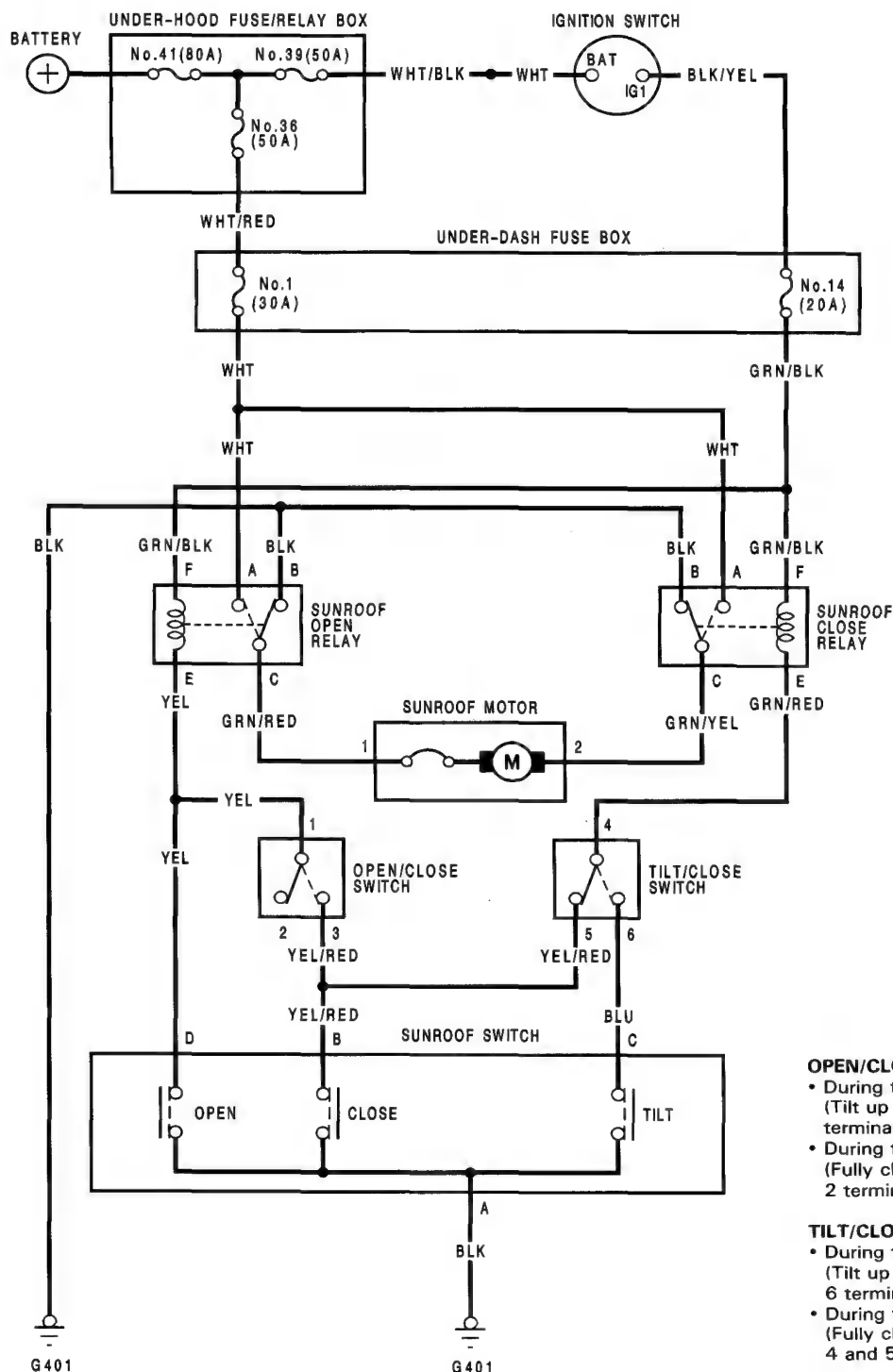
Sunroof

Circuit Diagram (Hatchback)





Circuit Diagram (Sedan)



OPEN/CLOSE SWITCH:

- During the tilting operation (Tilt up ↔ Fully closed) 1 and 3 terminals are connected.
- During the sliding operation (Fully closed ↔ Fully open) 1 and 2 terminals are connected.

TILT/CLOSE SWITCH:

- During the tilting operation (Tilt up ↔ Fully closed) 4 and 6 terminals are connected.
- During the sliding operation (Fully closed ↔ Fully open) 4 and 5 terminals are connected.

Sunroof

Electrical Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected	Clutch out of adjustment, foreign matter stuck between guide rail and sunroof, or outer cable not attached properly.	Blown No. 1 (30 A) fuse (in the under-dash fuse box)	Blown No. 14 (20 A) fuse (in the under-dash fuse box)	Function Test	Open relay	Close relay	Sunroof motor	Sunroof switch	Tilt switch (sensor)	Poor ground	Open circuit, loose or disconnected terminals.
Sunroof does not move, but motor turns.			1										
Sunroof does not move and motor does not turn (sunroof can be moved with sunroof wrench).	With either switch.		1	2	3				5	4		G401	WHT, GRN/BLK, GRN/YEL or GRN/RED
	With OPEN switch.						1	2		3			GRN/YEL or GRN/RED
	With CLOSE switch.						2	1		3			GRN/RED or GRN/YEL
	With TILT switch						1 (2)	2 (1)		4	3		GRN/RED or GRN/YEL

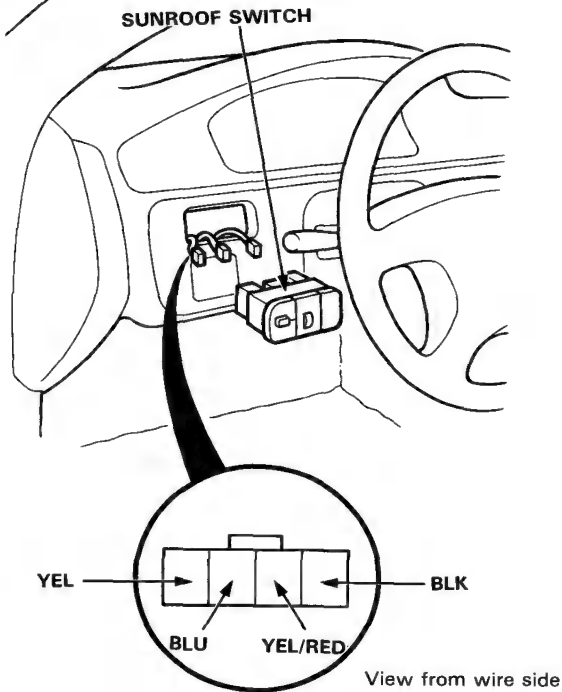
(): Sedan



Function Test

NOTE: Be careful not to damage the switch and the dashboard panel.

1. Carefully pry the switches out of the dashboard.
2. Disconnect the connectors from the switches.



3. Connect the YEL terminal to body ground with a jumper wire.
The sunroof should open when the ignition switch is turned ON.
 - If the sunroof opens, check the switch.
 - If not, check for an open in the YEL wire.

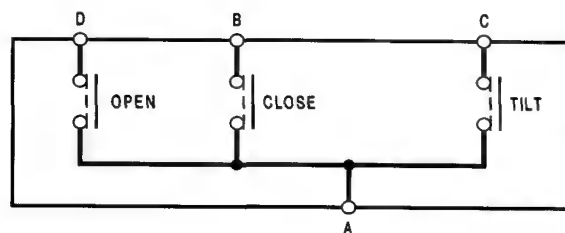
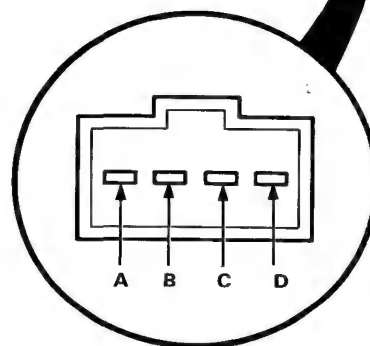
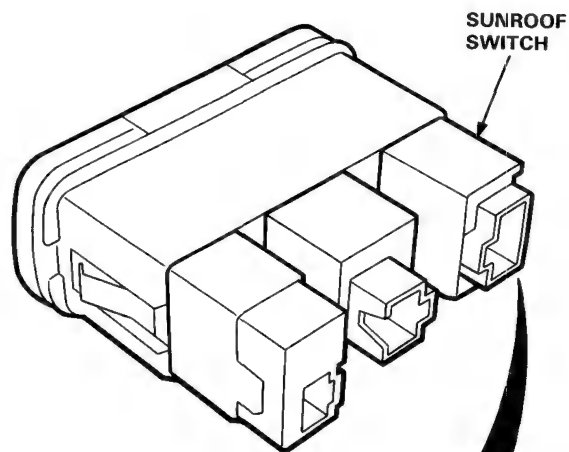
4. Connect the YEL/RED terminal to body ground with a jumper wire.
The sunroof should close when the ignition switch is turned ON.
 - If the sunroof closes, check the switch.
 - If not, check for an open in the YEL/RED wire.
5. Connect the BLU terminal to body ground with a jumper wire.
The sunroof should tilt up when the ignition switch is turned ON.
 - If the sunroof tilts up, check the switch.
 - If not, check for an open in the BLU wire.
6. Check for continuity to body ground on the BLK wire.
 - There should be continuity to ground.
 - If there is no continuity, check for an open in the BLK wire.

Sunroof

Switch Test

1. Carefully remove the switches from the dashboard.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B	C	D
OFF				
OPEN	○			○
CLOSE	○	○		
TILT	○		○	



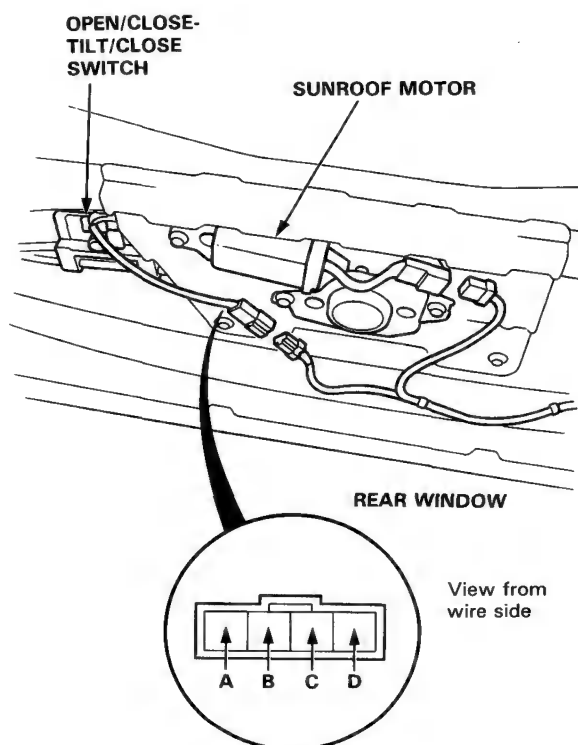


Open/Close—Tilt/Close Switch Test (Sedan)

1. Remove the rooflining.
2. Disconnect the 2-P and 4-P connectors from the sunroof motor and the switch.
3. Check for continuity between the terminals in each position according to the table.

Terminal Position	A	B	C	D
TILT	○ — ○		○ — ○	
CLOSE	○ — ○		○ — ○	
OPEN		○ — ○		○ — ○

4. If there is no continuity, repair or replace the switch.



Sunroof

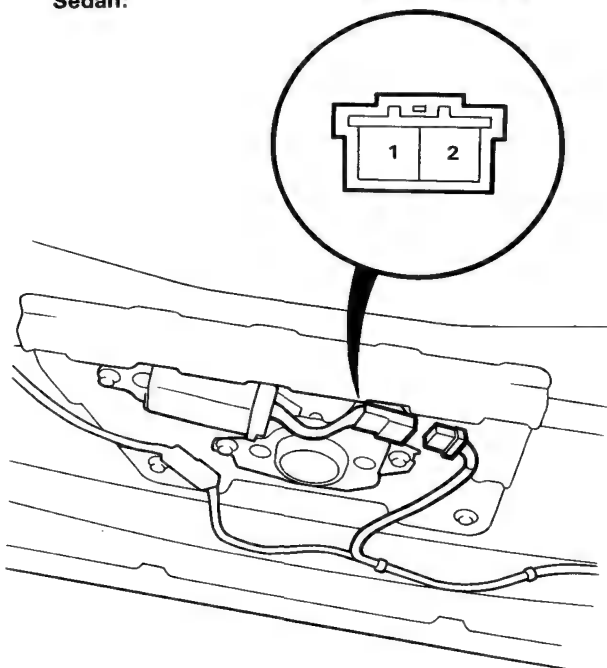
Motor Test

1. Remove the headliner.
2. Disconnect the 2-P connector from the sunroof motor.
3. Test motor operation by connecting battery power to the No. 1 and No. 2 terminals. Test the motor in each direction by switching the leads.
4. If the motor does not run, replace it.

NOTE: See closing force check in Section 20 for motor clutch test.

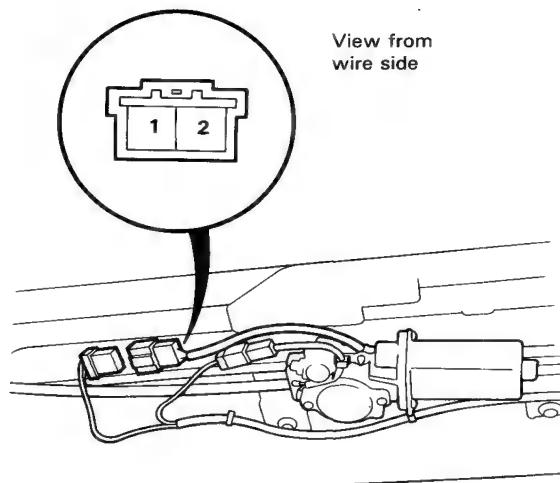
Sedan:

View from wire side



Hatchback:

View from wire side

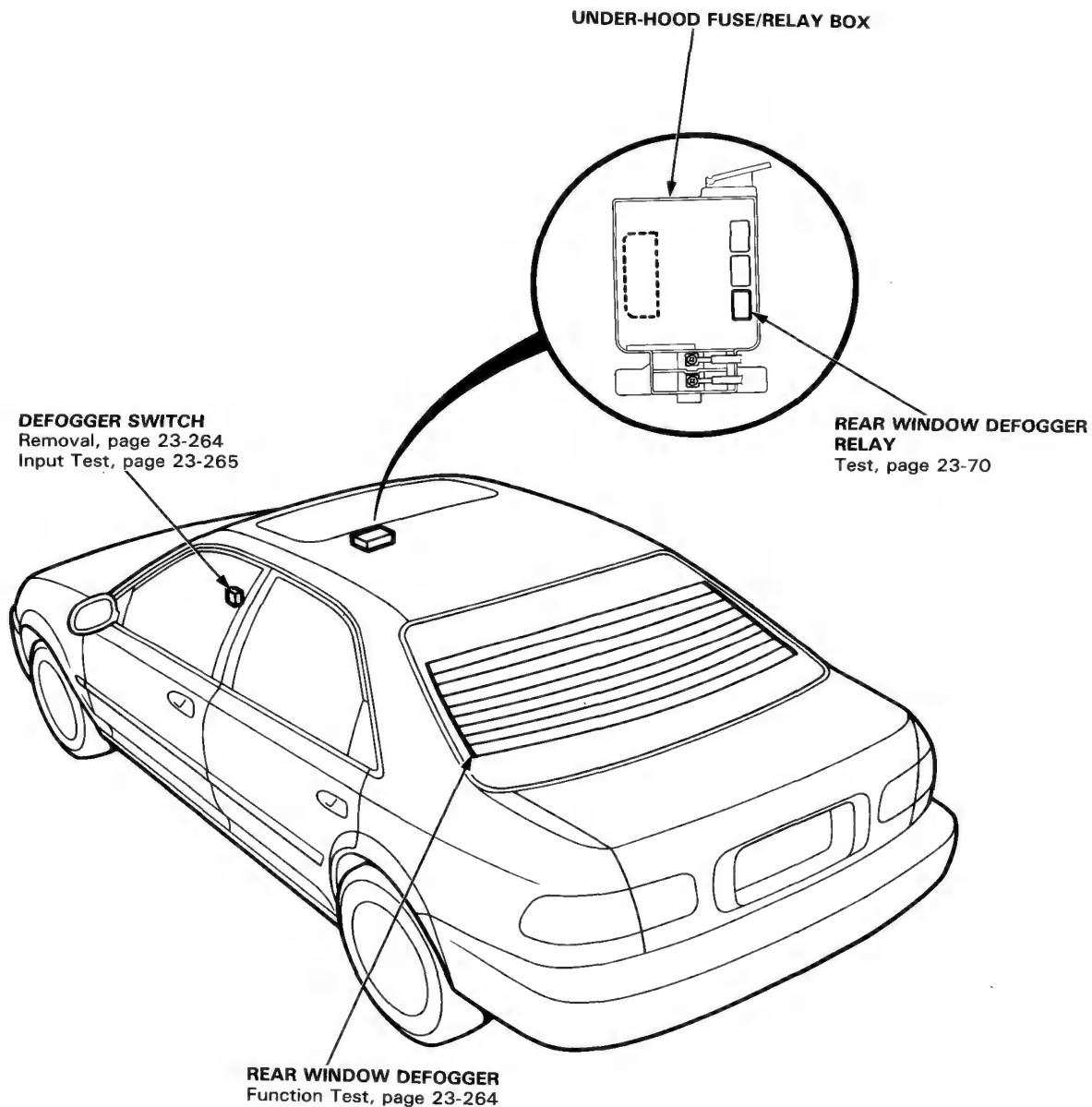


Rear Window Defogger

Component Location Index



NOTE: LHD type is shown, RHD type is symmetrical.



└ Circuit Diagram





Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom	Item to be inspected							Open circuit, loose or disconnected terminals.
	Blown indicator light bulb	Blown No. 13 (7.5 A) fuse (in the under-dash fuse box)	Blown No. 34 (30 A) fuse (in the under-hood fuse/relay box)	Function test	Defogger relay	Defogger switch	Poor ground	
Defogger operates, but indicator light does not go on.	1							BLK/YEL
Defogger does not operate and indicator light does not go on.		1				2	G401	YEL, BLU/YEL or BLK/YEL
Defogger does not operate, but indicator light goes on.			1	3	2	4	G*	BLU/YEL, BLK/YEL or BLK/GRN

* G553: Hatchback

G554: Sedan

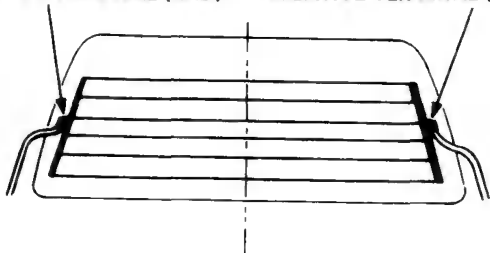
Rear Window Defogger

Function Test

CAUTION: Be careful not to scratch or damage the defogger wires with the tester probe.

1. Check for voltage between the positive terminal and body ground with the ignition switch and the defogger switch ON.
There should be battery voltage.
 - If there is no voltage, check for:
 - Faulty defogger relay.
 - Faulty defogger switch.
 - An open in the BLK/GRN wire.
 - If there is battery voltage, go to step 2.

NEGATIVE TERMINAL POSITIVE TERMINAL
POSITIVE TERMINAL (RHD) NEGATIVE TERMINAL (RHD)

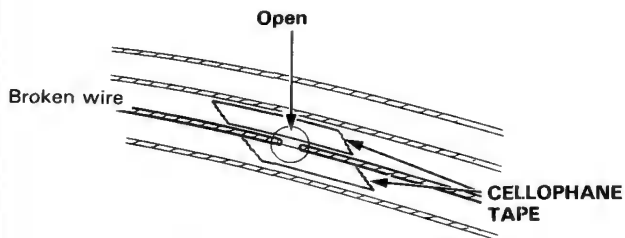


2. Check for continuity between the negative terminal and body ground.
If there is no continuity, check for an open in the defogger ground wire.
3. Touch the voltmeter positive probe to the middle of each defogger wire, and the negative probe to the negative terminal.
There should be approximately 6V with the ignition switch and the defogger switch ON.
 - If the voltage is as specified, the defogger wire is OK.
 - If there is battery voltage, the defogger wire is broken on the negative side.
 - If there is no voltage, the defogger wire is broken on the positive side.

Defogger Wire Repair

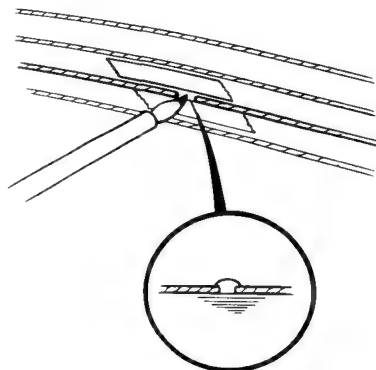
NOTE: Repair section must be no longer than one inch.

1. Lightly scour area around the break with fine steel wool, then clean with alcohol.
2. Carefully mask the broken portion of the defogger wire with cellophane tape.



3. Using a small brush, apply heavy coat of silver conductive paint extending about 1/8 in. on both sides of the break. Allow 30 minutes to dry.

NOTE: Thoroughly mix paint before use.



4. Check for proper operation with a voltmeter (approximately 6 V at the mid-point).
5. Apply a second coat of paint in the same manner.
Dry 3 hours before removing tape.



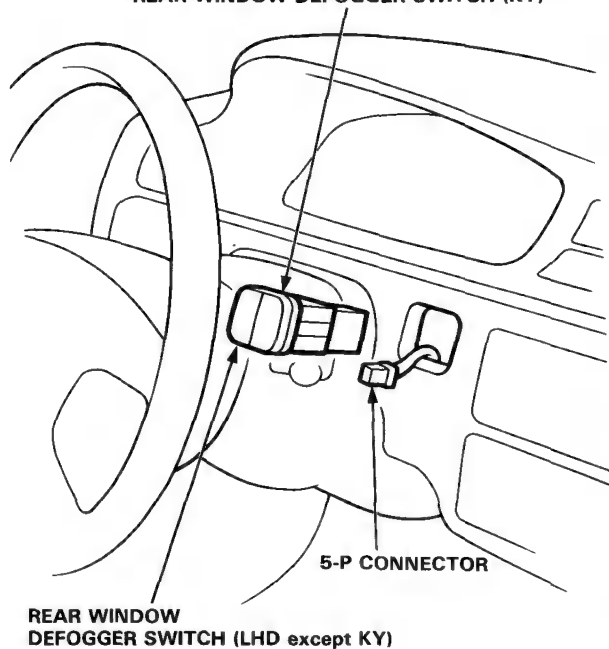
Switch Removal

NOTE: Be careful not to damage the instrument panel.

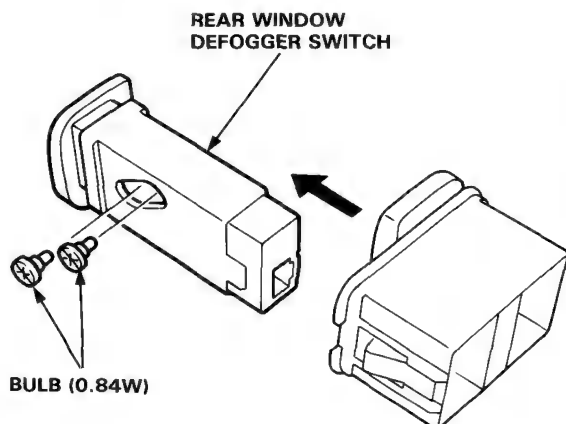
1. Carefully pry the switch out of the instrument panel.
2. Disconnect the 5-P connector from the switch.

NOTE: LHD is shown; RHD is symmetrical.

REAR WINDOW DEFOGGER SWITCH (KY)



3. Turn the socket 45° counterclockwise to remove either bulb.

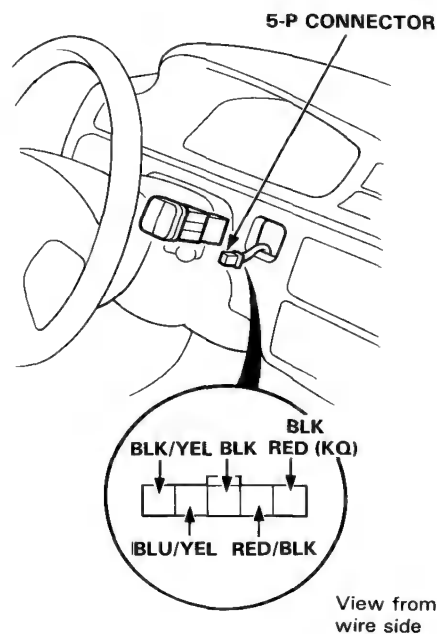


Switch Input Test

NOTE: Before testing, check for blown No. 13 (7.5A) fuse in the under-dash fuse box.

1. Remove the switch from the instrument panel.
2. Turn the ignition switch ON and check the voltage between the BLK/YEL (+) and the BLK (-) terminals.
There should be battery voltage.

- If there is no voltage, check for an open in the BLK/ YEL wire.
- If there is battery voltage, go to step 3.

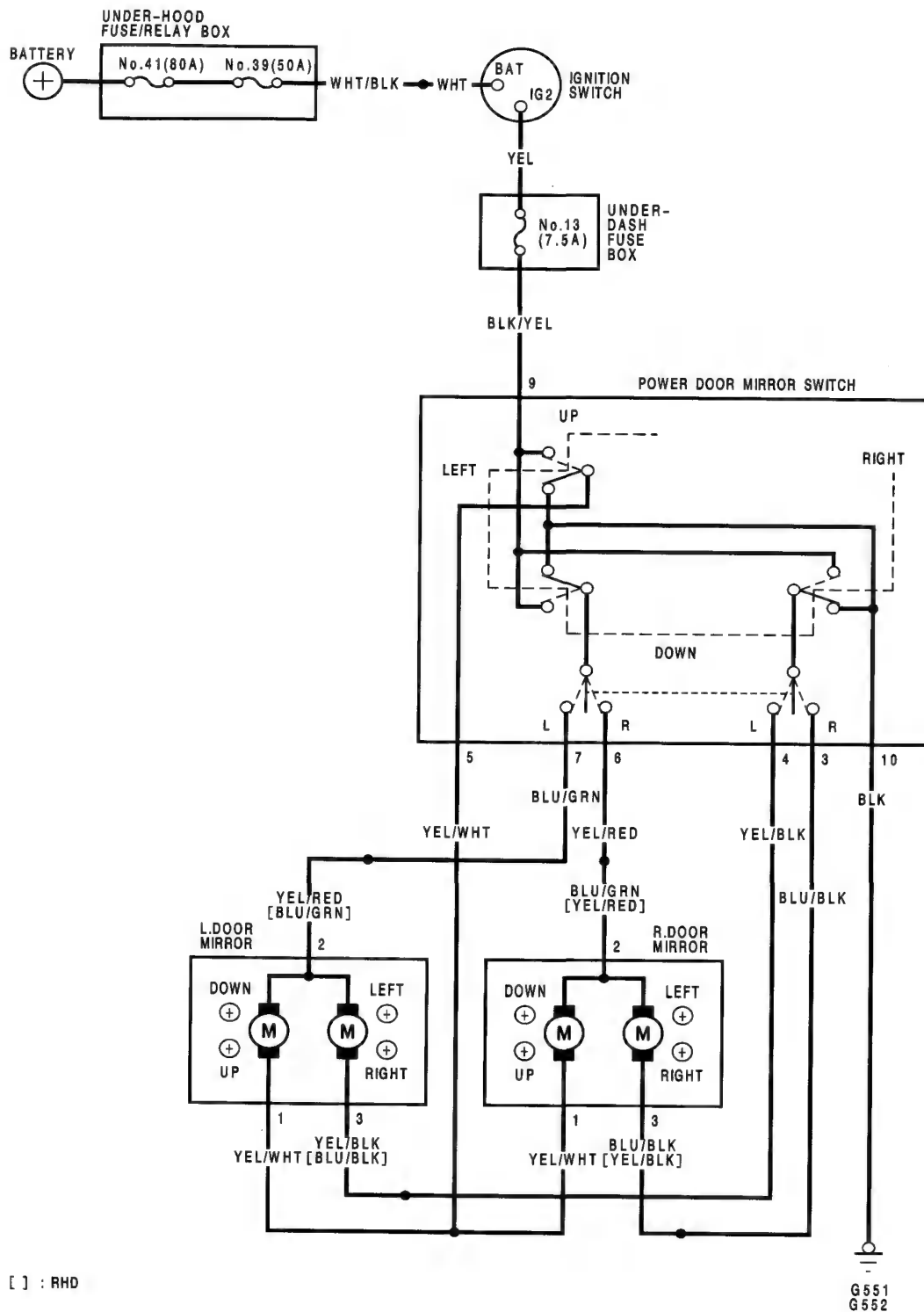


3. Connect a jumper wire between the BLK/YEL and the BLU/YEL terminals.
Turn the ignition switch ON and check that the rear window defogger operates normally.

- If the rear window defogger operates normally, replace the defogger switch.

Power Door Mirrors

Circuit Diagram



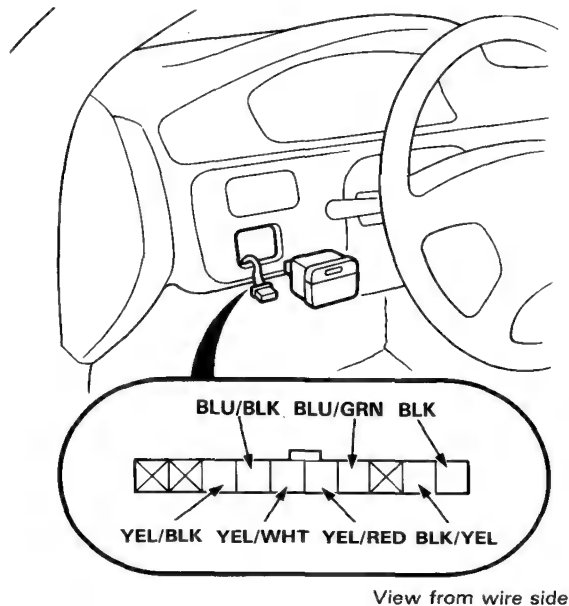


Function Test

NOTE: Be careful not to damage the switch and the dashboard.

1. Carefully pry the switch out of the dashboard.
2. Disconnect the connector from the switch.

NOTE: LHD is shown; RHD is symmetrical.



View from wire side

Mirror Test

One or both inoperative:

1. Check for voltage between the BLK/YEL terminal and body ground with the ignition switch ON. There should be battery voltage.
 - If there is no voltage, check for:
 - Blown No. 13 (7.5A) fuse in the under-dash fuse box.
 - A break in the BLK/YEL wire.
 - If there is battery voltage, go to step 2.
2. Check for continuity between the BLK terminal and body ground. There should be continuity.
 - If there is no continuity, check for:
 - A break in the BLK wire.
 - Poor ground (G551, G552).

Left mirror inoperative:

Connect the BLK/YEL terminal of the 10-P connector to the BLU/GRN terminal and the YEL/WHT (or BLU/BLK) terminal to body ground with jumper wires.

The left mirror should tilt down (or swing left) when the ignition switch is turned ON.

- If the mirror does not tilt down (or does not swing left), remove the left door panel and check for a break in the YEL/WHT (or YEL/BLK and BLU/BLK [BLU/BLK]) wire between the left door mirror and the switch.

If the wire is OK, check the left door mirror motor.

- If the mirror neither tilts down nor swings left, repair the YEL/RED or BLU/GRN [BLU/GRN] wire between the left mirror and the switch.
- If the mirror operates properly, check the mirror switch.

Right mirror inoperative:

Connect the BLK/YEL terminal of the 10-P connector to the YEL/RED terminal and the YEL/WHT (or YEL/BLK) terminal to body ground with jumper wires.

The right mirror should tilt down (or swing left) when the ignition switch is turned ON.

- If the mirror does not tilt down (or does not swing left), remove the right door panel and check for a break in the YEL/WHT (or BLU/BLK and YEL/BLK [YEL/BLK]) wire between the right door mirror and the switch. If the wire is OK, check the right door mirror motor.
- If the mirror neither tilts down nor swings left, repair the BLU/GRN or YEL/RED [YEL/RED] wire between the right mirror and the switch.
- If the mirror operates properly, check the mirror switch.

[]: RHD

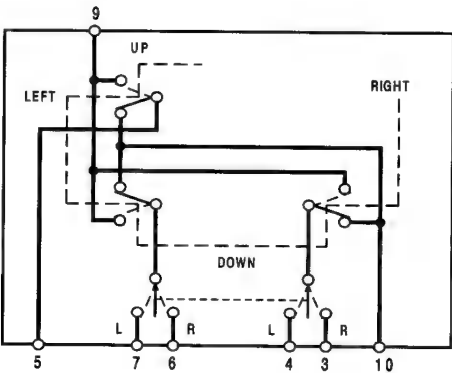
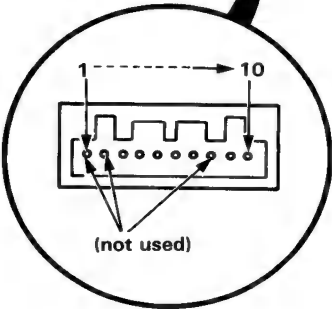
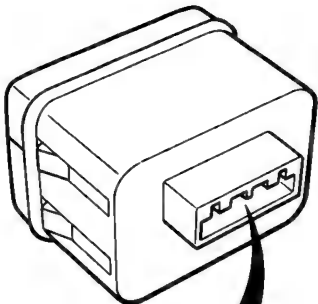
Power Door Mirrors

Switch Test

- 1. Carefully pry the switch out of the dashboard and disconnect its connector.
- 2. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch

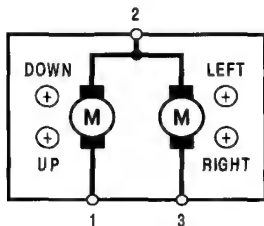
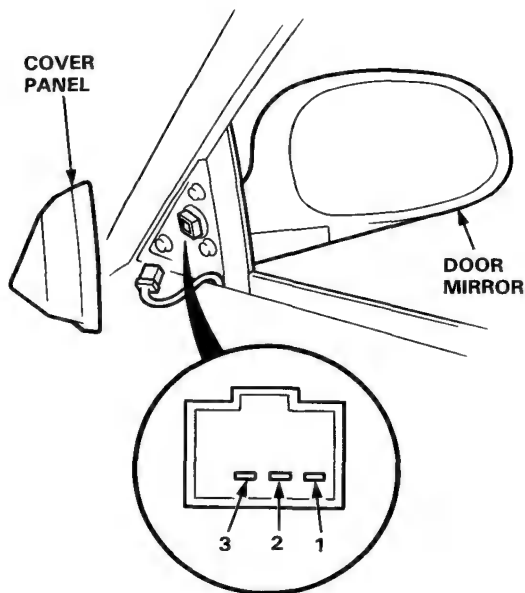
Terminal Position		9	10	5	4	7	3	6
R	OFF		○	○			○	○
	UP	○		○				
	DOWN	○					○	○
	LEFT	○		○				○
	RIGHT	○					○	
L	OFF		○	○	○	○		
	UP	○		○		○		
	DOWN	○		○	○	○		
	LEFT	○		○	○			
	RIGHT	○		○	○			





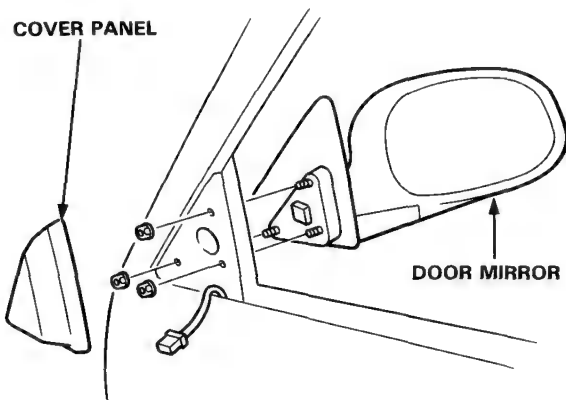
Door Mirror Replacement

1. Carefully pry out the cover panel with a flat tip screwdriver, then disconnect the 8-P connector from the door mirror actuator.
2. Test actuator operation:
TILT UP: Connect battery power to the No. 1 terminal and ground to the No. 2 terminal.
TILT DOWN: Connect battery power to the No. 2 terminal and ground to the No. 1 terminal.
SWING LEFT: Connect battery power to the No. 2 terminal and ground to the No. 3 terminal.
SWING RIGHT: Connect battery power to the No. 3 terminal and ground to the No. 2 terminal.
3. If the mirror fails to operate properly, replace it.



Door Mirror Test

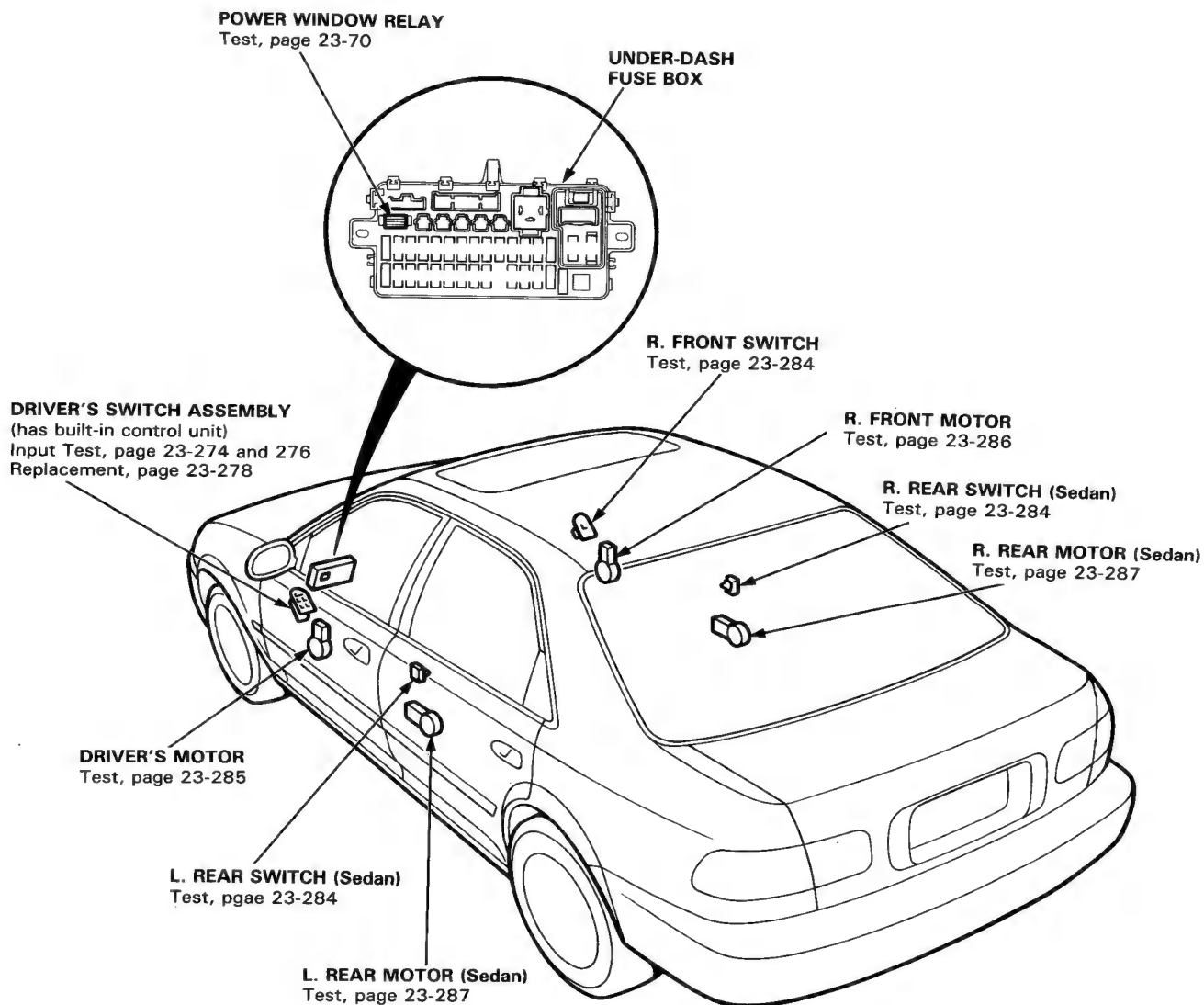
1. Carefully pry out the cover panel with a flat tip screwdriver.
2. Disconnect the 8-P connector from the mirror.
3. While holding the mirror with one hand, remove its mount nuts with the other.



Power Windows

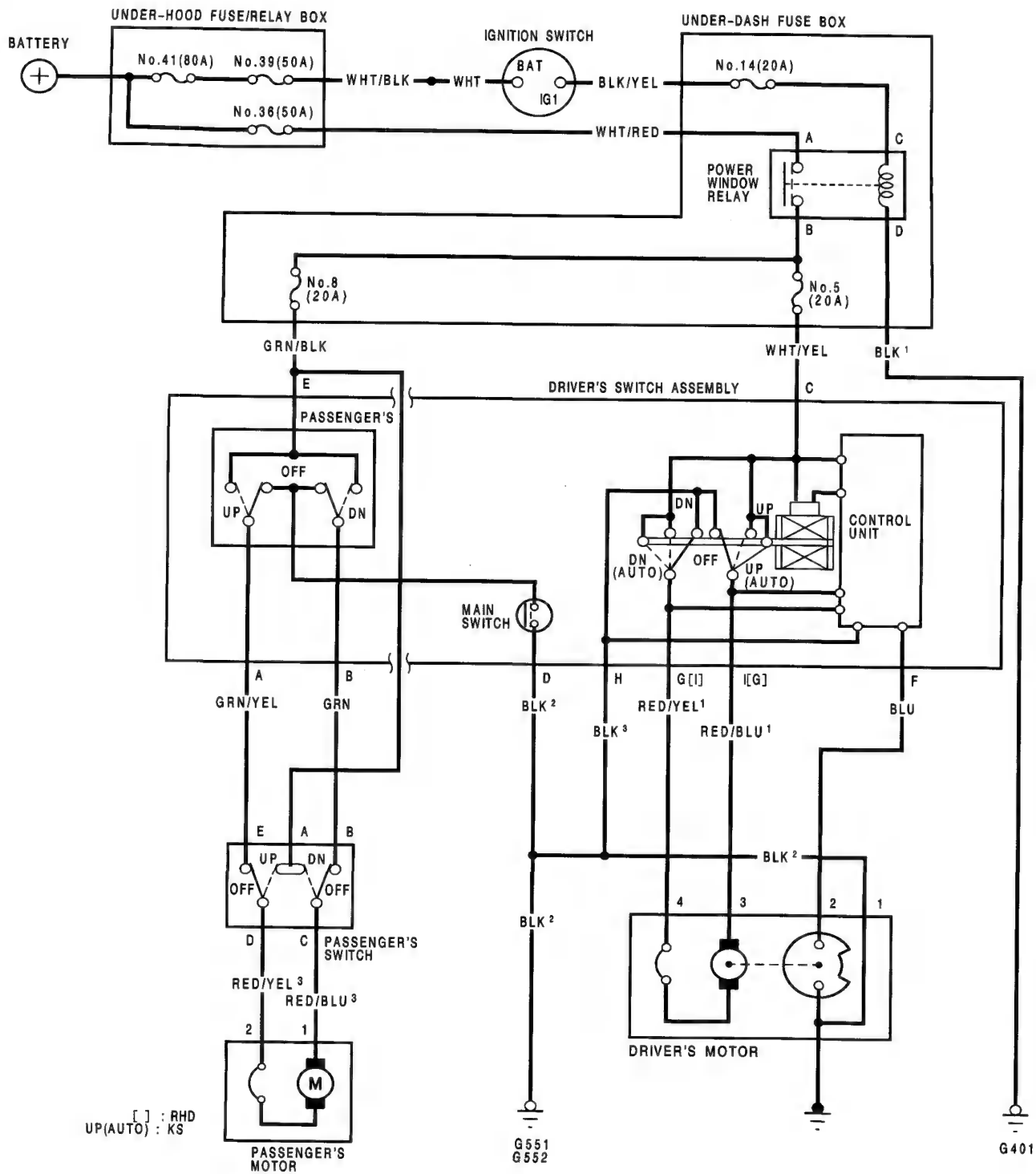
Component Location Index

NOTE: LHD type is shown; RHD type is symmetrical.



Power Windows

Circuit Diagram (Hatchback)





Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected	Blown No. 14 (20 A) fuse (in the under-dash fuse box)	Power window relay				in the under-dash fuse box				Driver's switch	Passenger's switch	Driver's motor	Pulser (in driver's motor)	Passenger's motor	Window regulator	Driver's switch assembly input	Poor ground	Open circuit, loose or disconnected terminals
				Blown No. 5 (20 A) fuse	Blown No. 8 (20 A) fuse	Blown No. 4 (20 A) fuse	Blown No. 7 (20 A) fuse													
All windows do not operate.			1	2															G401	BLK/YEL or WHT/RED
Driver's window does not operate.					1									2			3	4		WHT/YEL
Driver's window does not operate in AUTO.															2			1		BLU
Passenger's windows do not operate.	Right front					1				2	3					4	5			BLU/BLK
	Left rear							1		2	3					4	5			GRN/BLK ²
	Right rear							1		2	3					4	5			YEL/BLK

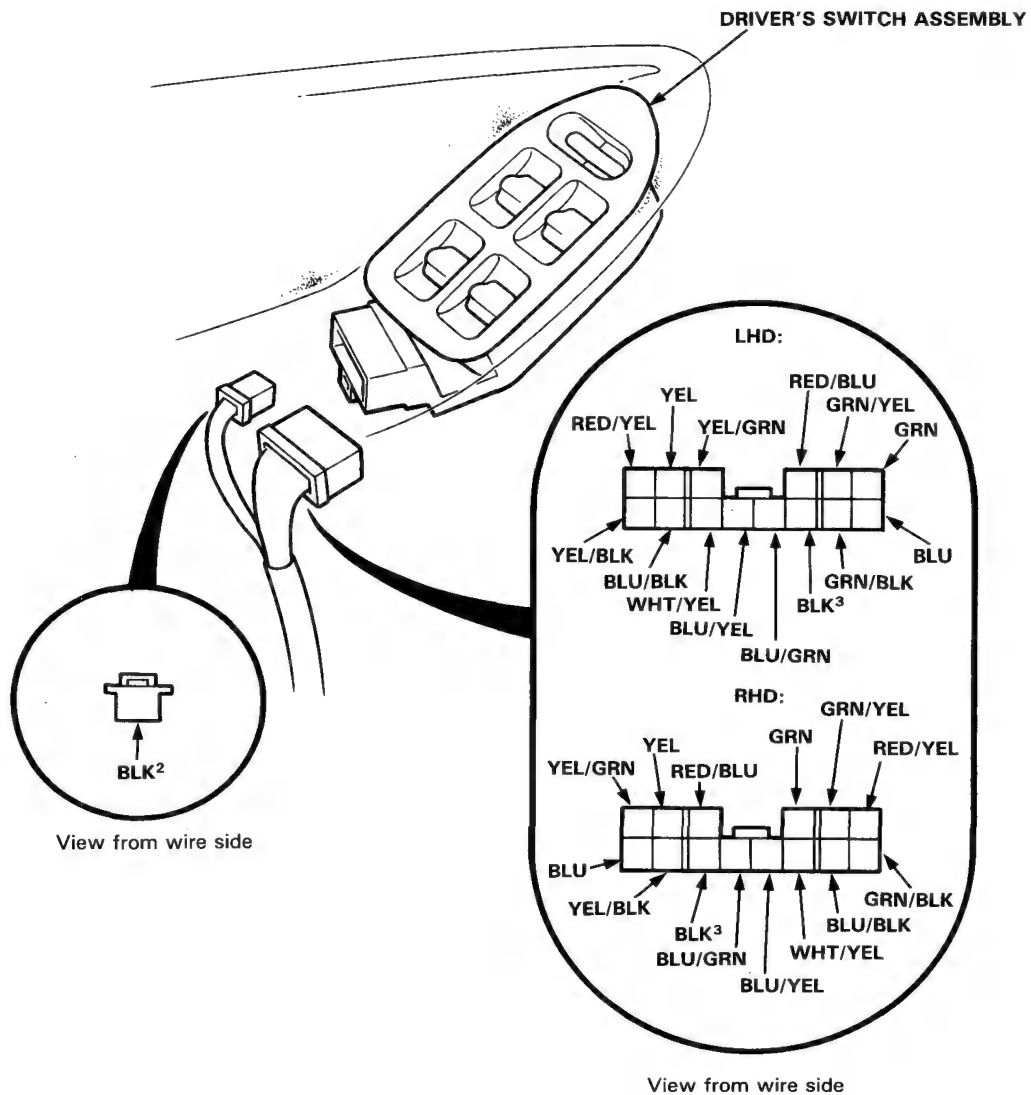
Power Windows

Driver's Switch Assembly Input Test (Sedan)

NOTE: The control unit is built into the driver's switch assembly, and only controls driver's door window operation.

Remove the driver's door panel and disconnect the 14-P and 1-P connectors from the driver's switch assembly. Make the following input tests at the connector terminals.

NOTE: Recheck the connections between the 14-P and 1-P connectors and the driver's switch assembly, then replace the driver's switch assembly if all input tests prove OK.





No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK ²	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G551, G552). • A break in the wire.
2	WHT/YEL	Ignition switch is ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 4, 5, 7 or 8 (20 A) fuse. • Poor ground (G401). • Faulty power window relay. • A break in the wire.
	BLU/BLK			
	YEL/BLK			
	GRN/BLK			
3	RED/BLU ¹ and RED/YEL ¹	Connect the WHT/YEL terminal to the RED/BLU ¹ terminal, and the RED/YEL ¹ terminal to the BLK ² terminal, then turn ignition switch ON.	Check the driver's motor operation: it should run.	<ul style="list-style-type: none"> • Faulty driver's motor. • A break in the wire.
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK terminal to the BLU/YEL terminal, and the BLU/GRN terminal to the BLK ² terminal, then turn ignition switch ON.	Check the right front motor operation: it should run.	<ul style="list-style-type: none"> • Faulty R. front motor. • Faulty R. front switch. • A break in the wire.
5	YEL and YEL/GRN	Connect the YEL/BLK terminal to the YEL terminal, and the YEL/GRN terminal to the BLK ² terminal, then turn ignition switch ON.	Check the right rear motor operation: it should run.	<ul style="list-style-type: none"> • Faulty R. rear motor. • Faulty R. rear switch. • A break in the wire.
6	GRN/YEL and GRN	Connect the GRN/BLK terminal to the GRN/YEL terminal, and the GRN terminal to the BLK ² terminal, then turn ignition switch ON.	Check the left rear motor operation: it should run.	<ul style="list-style-type: none"> • Faulty L. rear motor. • Faulty L. rear switch. • A break in the wire.
7	BLU and BLK ³	Connect the WHT/YEL terminal to the RED/YEL ¹ terminal, and the BLK ² terminal to the RED/BLU ¹ terminal, then turn ignition switch ON.	Check for resistance between the BLU and BLK ³ terminals: between 20—50 ohms should be indicated as the driver's motor runs.	<ul style="list-style-type: none"> • Faulty pulser. • Faulty driver's motor. • A break in the wire.

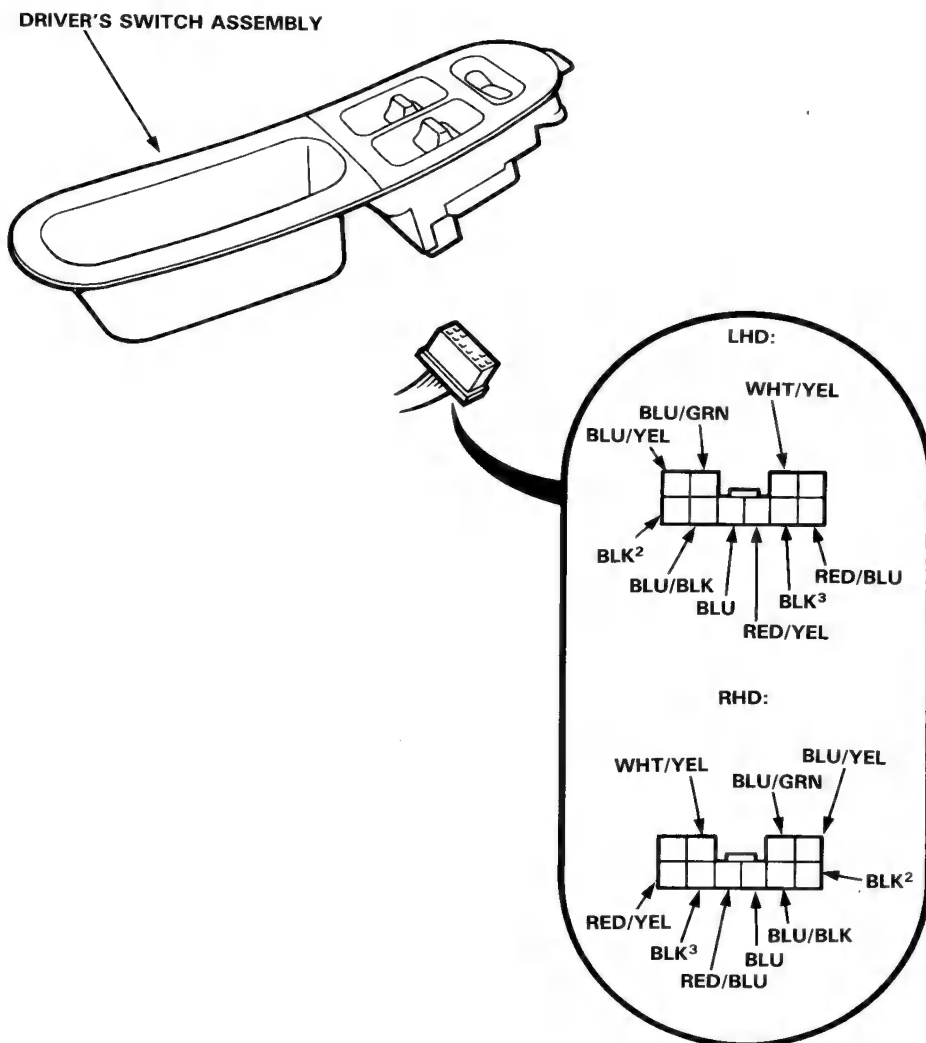
Power Windows

Driver's Switch Assembly Input Test (Hatchback)

NOTE: The control unit is built into the driver's switch assembly, and only controls driver's door window operation.

Remove the driver's door panel and disconnect the 10-P connector from the driver's switch assembly. Make the following input tests at the connector terminals.

NOTE: Recheck the connections between the 10-P connector and the driver's switch assembly, then replace the driver's switch assembly if all input tests prove OK.





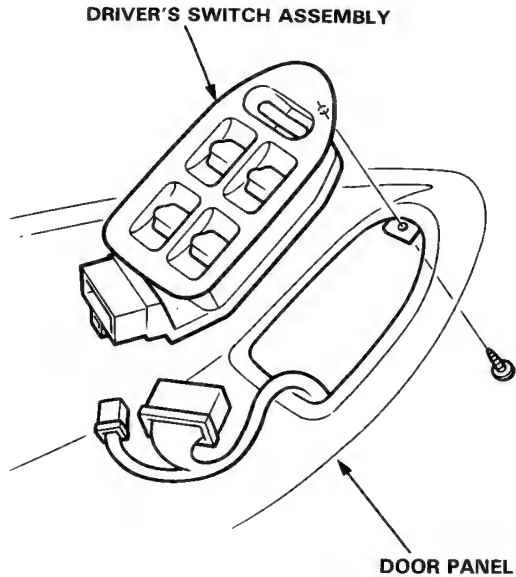
No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK ²	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none">• Poor ground (G551, G552).• A break in the wire.
2	WHT/YEL	Ignition switch is ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none">• Blown No. 5 or 8 (20 A) fuse.• Poor ground (G401).• Faulty power window relay.• A break in the wire.
	BLU/BLK			
3	RED/BLU ¹ and RED/YEL ¹	Connect the WHT/YEL terminal to the RED/BLU ¹ terminal, and the RED/YEL ¹ terminal to the BLK ² terminal, then turn ignition switch ON.	Check the driver's motor operation: it should run.	<ul style="list-style-type: none">• Faulty driver's motor.• A break in the wire.
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK terminal to the BLU/YEL terminal, and the BLU/GRN terminal to the BLK ² terminal, then turn ignition switch ON.	Check the passenger's motor operation: it should run.	<ul style="list-style-type: none">• Faulty passenger's motor.• Faulty passenger's switch.• A break in the wire.
5	BLU and BLK ³	Connect the WHT/YEL terminal to the RED/YEL ¹ terminal, and the BLK ² terminal to the RED/BLU ¹ terminal, then turn ignition switch ON.	Check for resistance between the BLU and BLK ³ terminals: between 20—50 ohms should be indicated as the driver's motor runs.	<ul style="list-style-type: none">• Faulty pulser.• Faulty driver's motor.• A break in the wire.

Power Windows

Driver's Switch Assembly Replacement

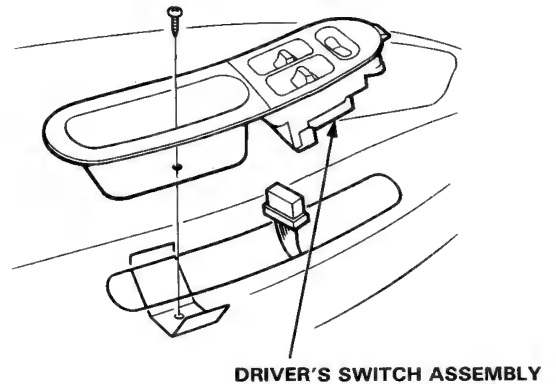
Sedan:

1. Remove the driver's door panel and disconnect the connector.
2. Remove the driver's switch assembly from the door panel by unscrewing the mounting screw.



Hatchback:

1. Remove the door panel and disconnect the connectors.
2. Remove the switch from the door panel by unscrewing the mounting screw.



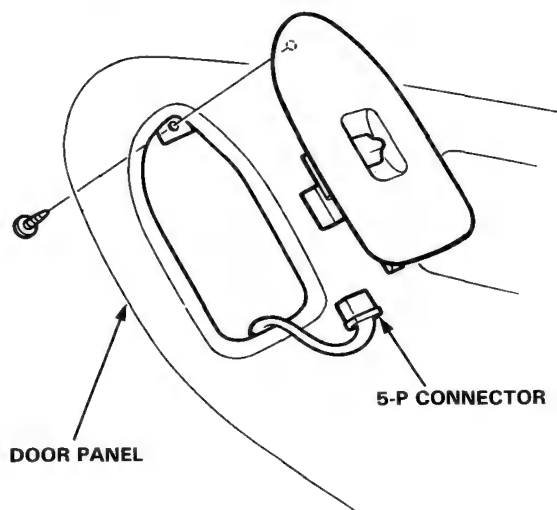


Passenger's Switch Replacement

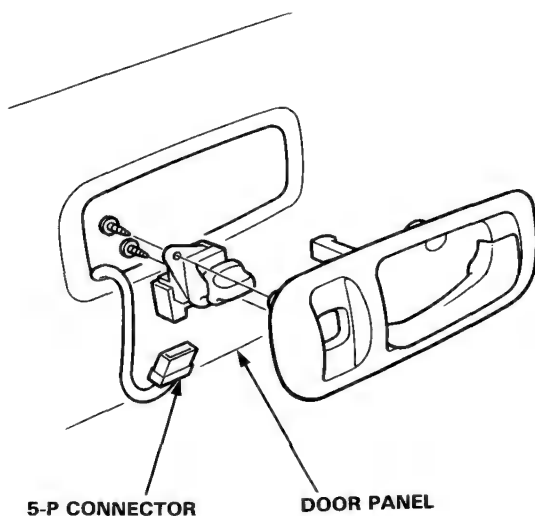
Sedan:

1. Remove the door panel and disconnect the connector.
2. Remove the switch from the door panel by unscrewing the mounting screw(s).

Front Passenger's Switch:

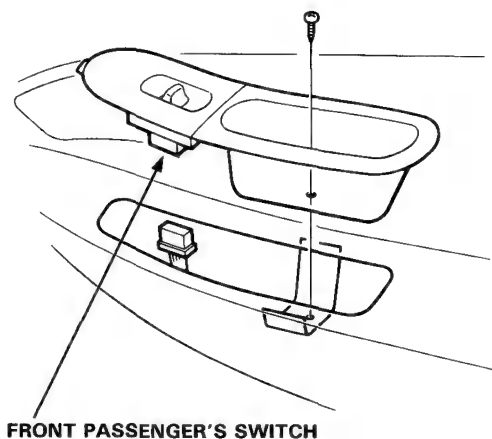


Rear Passenger's Switch:



Hatchback:

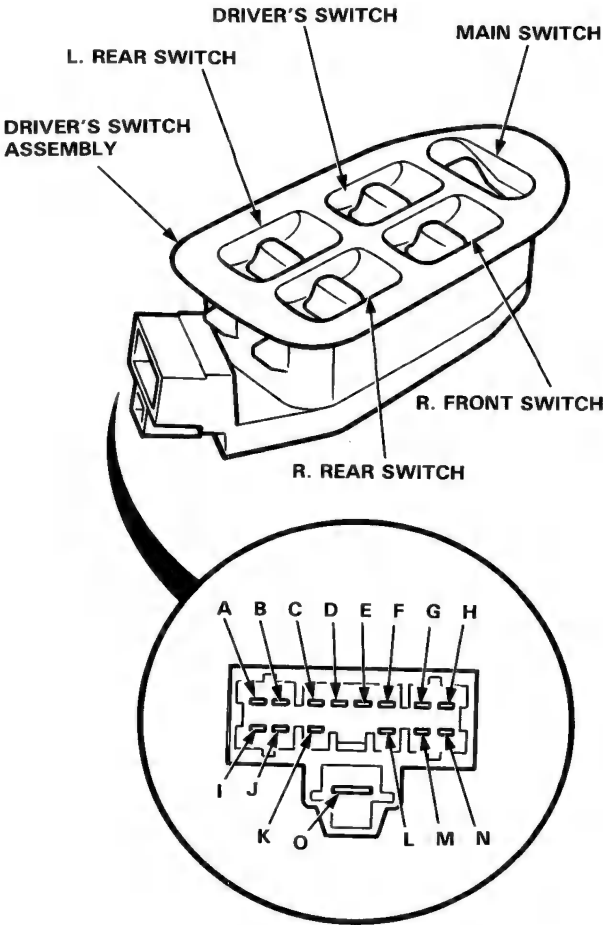
1. Remove the door panel and disconnect the connector.
2. Remove the switch from the door panel by unscrewing the mounting screw.



Power Windows

Driver's Switch Assembly Test (LHD: Sedan)

- 1. Remove the driver's switch assembly from the door panel.
- 2. Check for continuity between the terminals in each switch position according to the tables.



Driver's Switch

Terminal		F	N	C	K
Position					
OFF			○	○	○
UP/UP(AUTO)		○			○
DOWN/DOWN(AUTO)		○	○		

R. Front Switch

Terminal		D	E	G	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	

R. Rear Switch

Terminal		L	M	H	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	

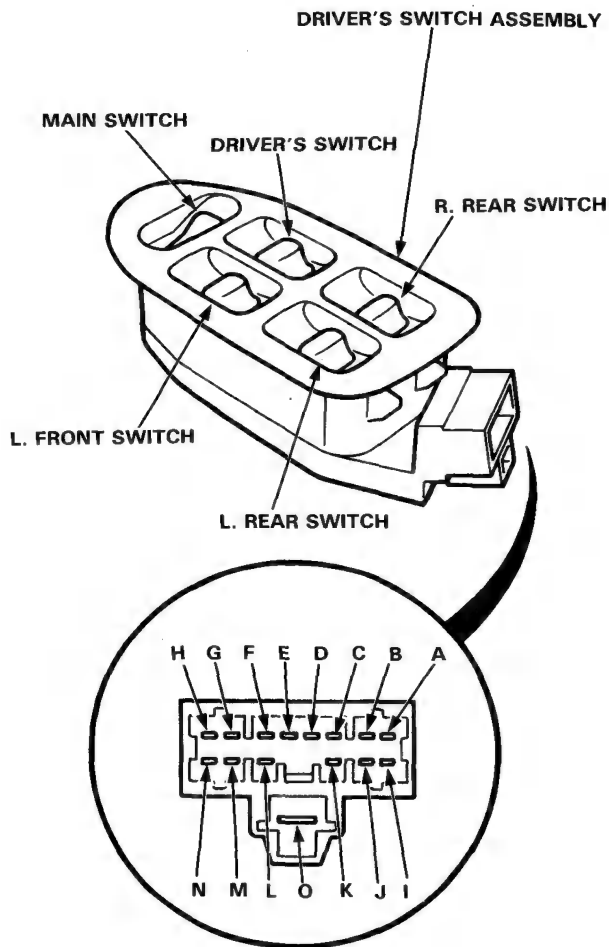
L. Rear Switch

Terminal		I	J	B	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	



Driver's Switch Assembly Test (RHD: Sedan)

1. Remove the driver's switch assembly from the door panel.
2. Check for continuity between the terminals in each switch position according to the tables.



Driver's Switch

Terminal		F	N	C	K
Position					
OFF	ON		○	○	○
	OFF				
UP/UP(AUTO)	ON	○			○
	OFF				
DOWN/DOWN(AUTO)	ON	○	○		
	OFF				

R. Front Switch

Terminal		D	E	G	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	

R. Rear Switch

Terminal		I	J	B	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	

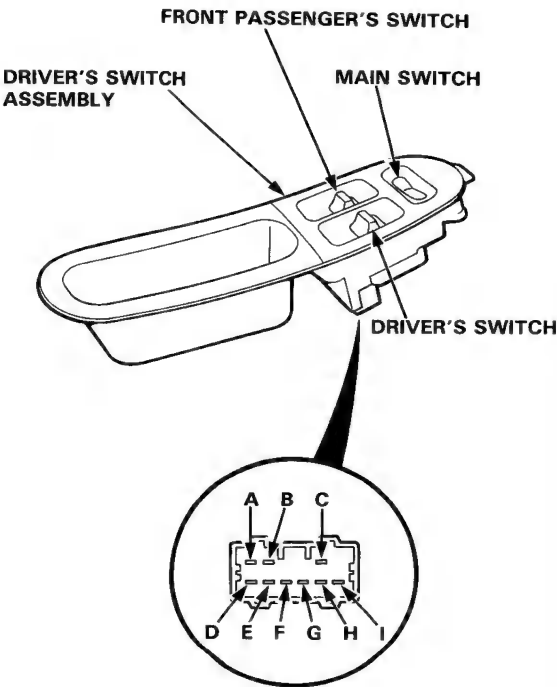
L. Rear Switch

Terminal		L	M	H	O
Position	Main Switch				
OFF	ON	○	○		○
	OFF	○	○		
UP	ON		○	○	
	OFF		○	○	
DOWN	ON	○		○	
	OFF	○		○	

Power Windows

Driver's Switch Assembly Test (LHD: Hatchback)

- 1. Remove the driver's switch assembly from the door panel.
- 2. Check for continuity between the terminals in each switch position according to the tables.



Driver's Switch

Terminal	C	G	H	I
Position				
OFF		○	○	○
UP/UP(AUTO)	○			○
DOWN/DOWN(AUTO)	○	○		

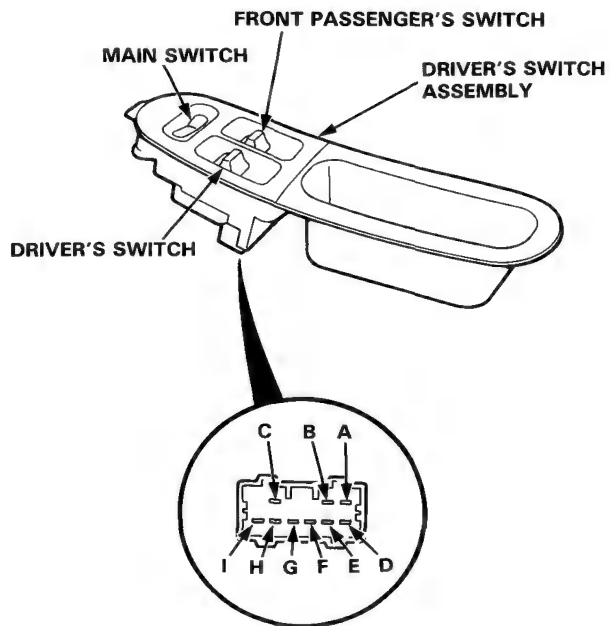
Front Passenger's Switch

Terminal	A	B	D	E
Position	Main Switch			
OFF	ON	○	○	○
	OFF	○	○	
UP	ON	○		○
	OFF	○		○
DOWN	ON	○		○
	OFF	○		○



Driver's Switch Assembly Test (RHD: Hatchback)

1. Remove the driver's switch assembly from the door panel.
2. Check for continuity between the terminals in each switch position according to the tables.



Driver's Switch

Terminal		C	G	H	I
Position					
OFF	ON		○	○	○
	OFF	○	○		
UP/UP(AUTO)	ON	○			
	OFF	○			
DOWN/DOWN(AUTO)	ON	○			
	OFF	○			○

Front Passenger's Switch

Terminal		A	B	D	E
Position	Main Switch				
OFF	ON	○	○	○	
	OFF	○	○		
UP	ON	○			○
	OFF	○			○
DOWN	ON		○		○
	OFF		○		○

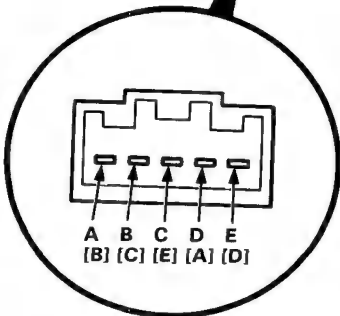
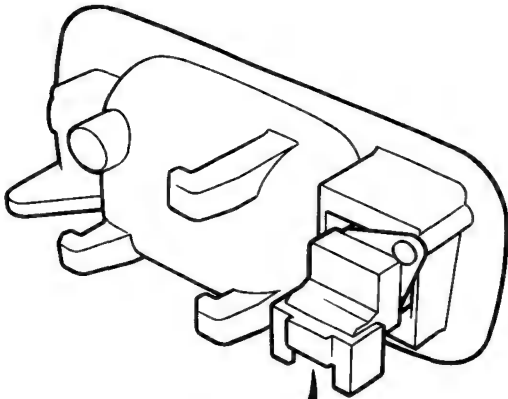
Power Windows

Passenger's Switch Test

- 1. Remove the door panel and disconnect the connector.
- 2. Check for continuity between the terminals in each switch position according to the table.

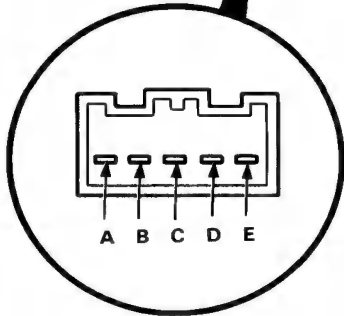
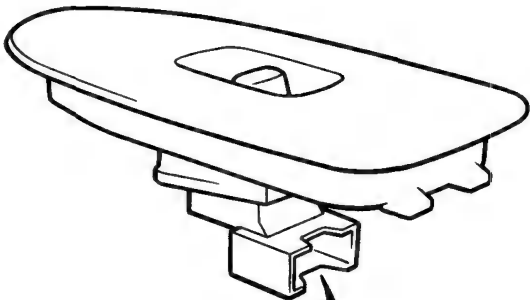
Terminal Position	A	B	C	D	E
UP	○			○	
OFF		○	○	○	○
DOWN	○		○		

Front Passenger's Switch:



[]: Hatchback

Rear Passenger's Switch:

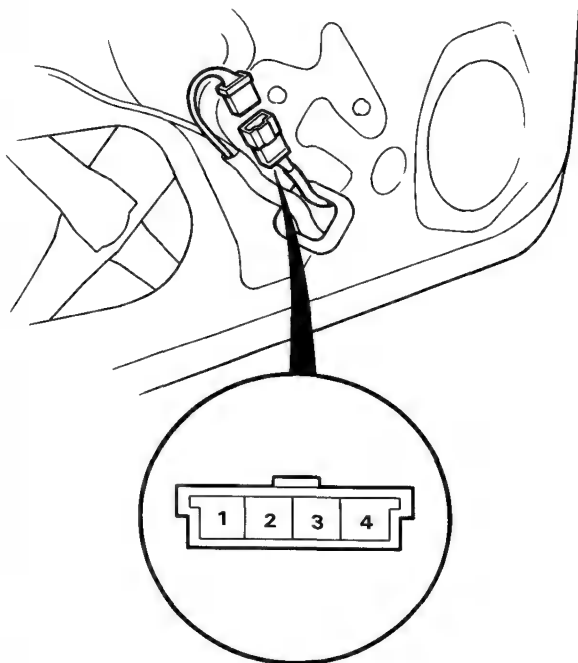




Driver's Motor Test

Motor Test:

1. Remove the door panel (see Section 20).
2. Disconnect the 4-P connector from the door wire harness.
3. Test motor operation by applying battery power to the No. 4 terminal and ground to the No. 3 terminal. Test the motor in each direction by switching the leads.

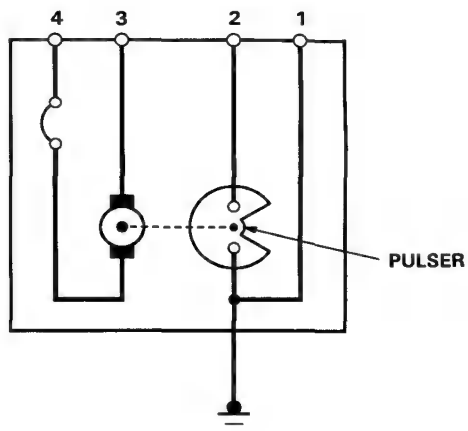


View from wire side

4. If the motor does not run, replace it.

Pulser Test:

Connect the test leads of an analog ohmmeter to the No. 1 and No. 2 terminals and check for needle movement while running the motor by applying battery voltage to the No. 4 and No. 3 terminals. The analog ohmmeter needle should move back and forth alternately.



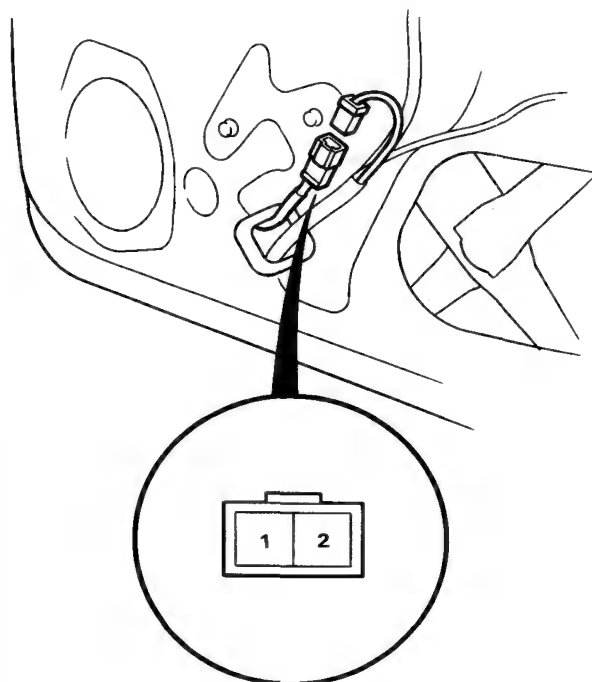
PULSER

Power Windows

Passenger's Motor Test

1. Remove the door panel (see Section 20).
2. Disconnect the 2-P connector from the motor.
3. Test motor operation by applying battery power to the No. 1 terminal and ground to the No. 2 terminal. Test the motor in each direction by switching the leads.

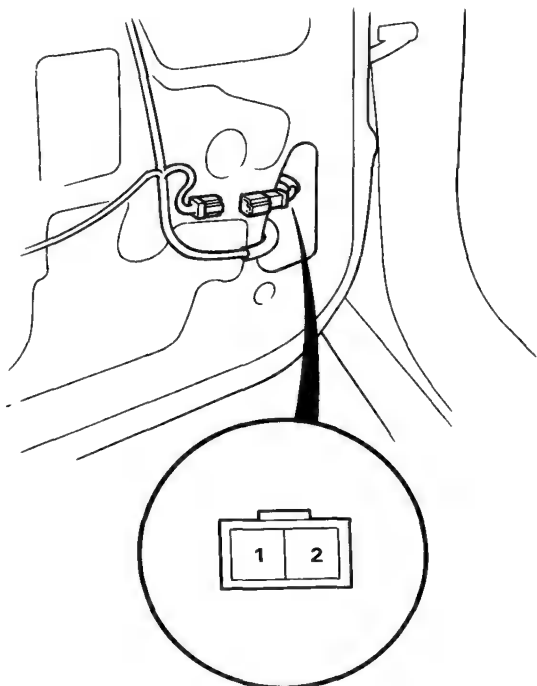
Front Passenger's Motor:



View from wire side

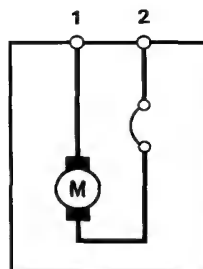


Rear Passenger's Motor:



View from wire side

4. If the motor does not run, replace it.



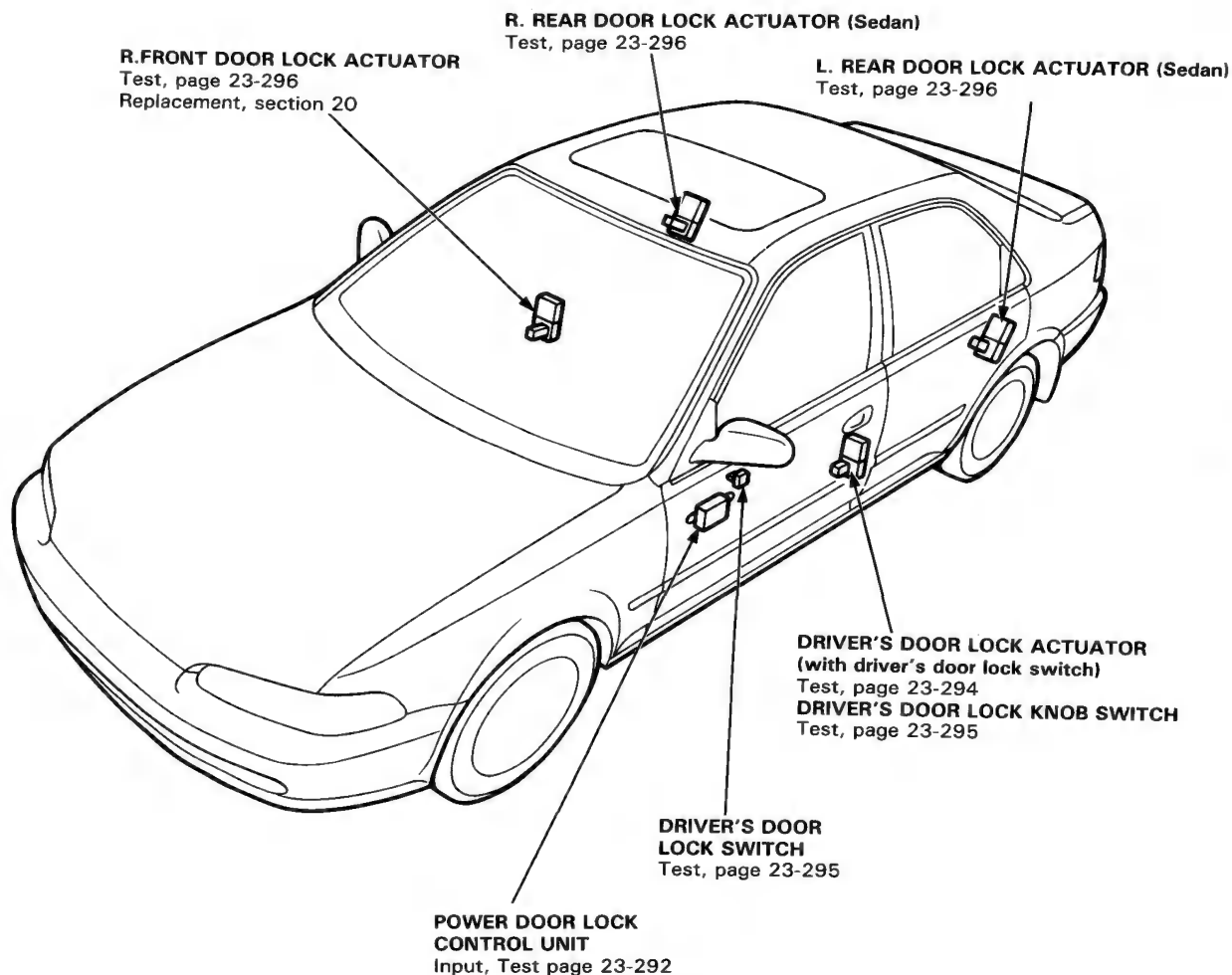
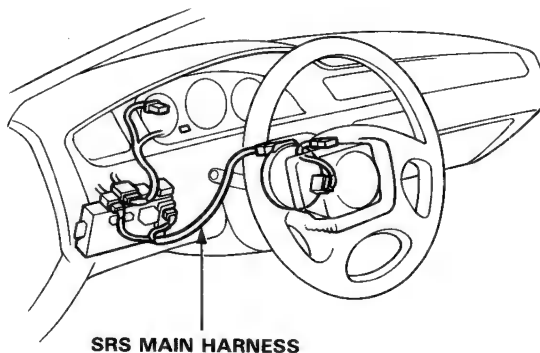
Power Door Locks

Component Location Index

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

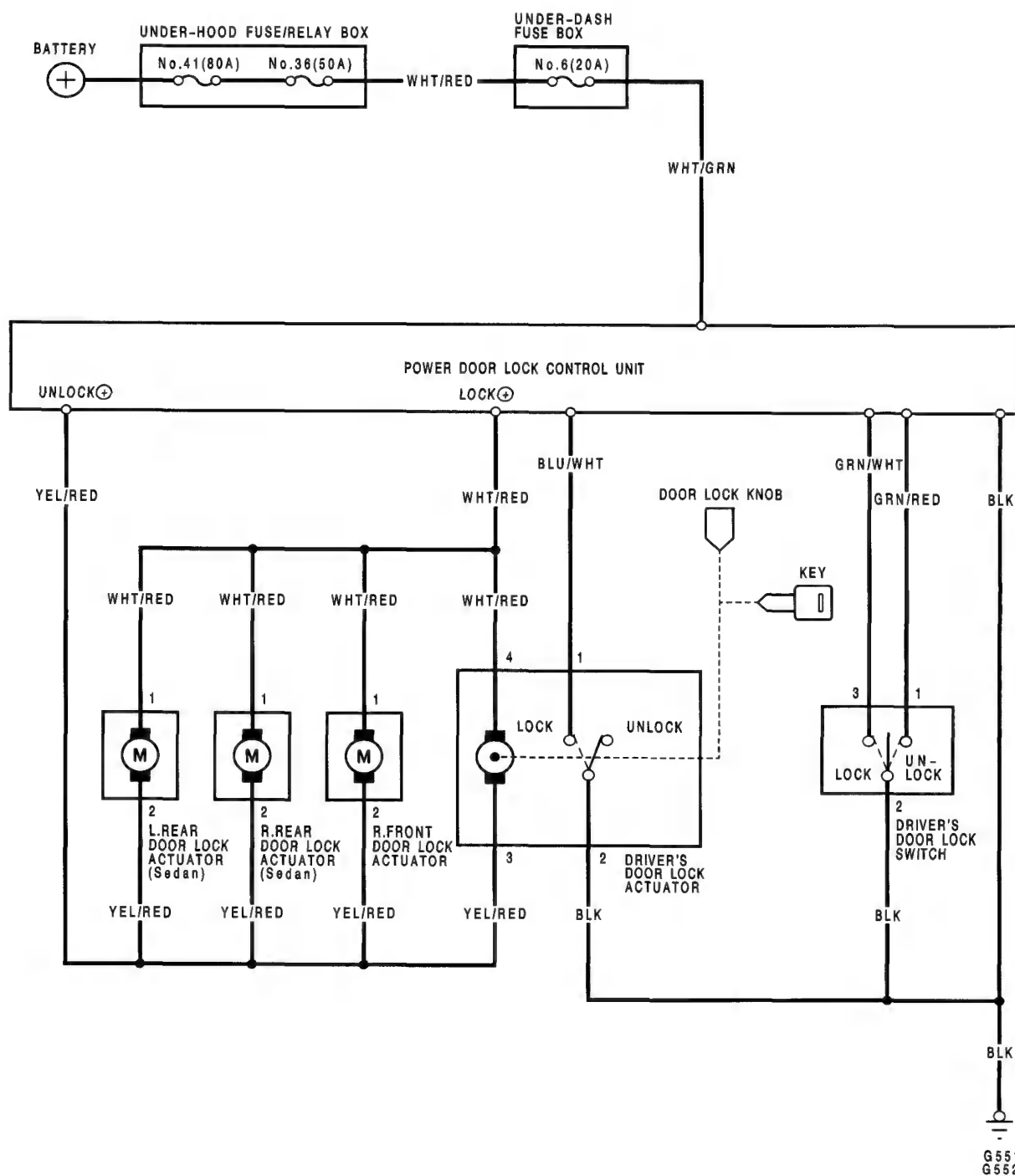
NOTE: LHD type is shown, RHD type is symmetrical.



Power Door Locks

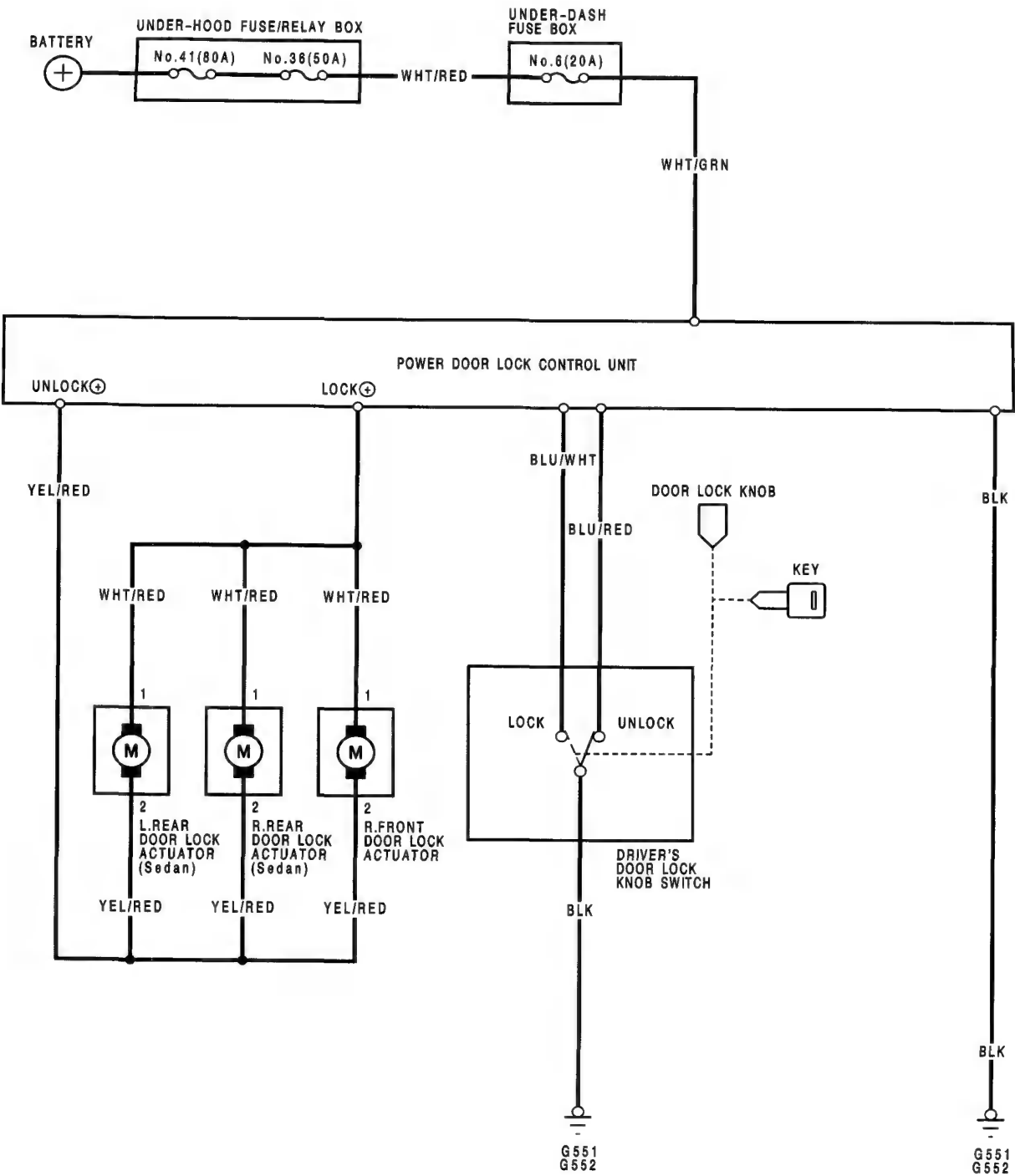


Circuit Diagram (with Driver's Door Lock Switch)



Power Door Locks

Circuit Diagram





Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom \ Item to be inspected		Blown No. 6 (20 A) fuse (in the under-dash fuse box)	Door lock knob switch (in the driver's door actuator)	*Driver's door lock actuator	Control unit input	Passenger's door actuator	Disconnected or obstructed door lock rod/linkage	Driver's door lock switch	Poor ground	Open circuit, loose or disconnected terminals.
Power door lock system does not operate at all.		1			2				G551 G552	WHT/GRN
Doors do not lock with driver's door lock knob switch.	All doors.	1	2		3		4		G551 G552	BLU/WHT, YEL/RED, WHT/RED
	One or more doors.					1	2			YEL/RED or WHT/RED
Doors do not lock or unlock with driver's door lock switch.	All doors.	1		5	3		4	2	G551 G552	BLU/RED, BLU/WHT GRN/RED *, GRN/WHT *, YEL/RED or WHT/RED
	One or more doors.					1	2			YEL/RED or WHT/RED

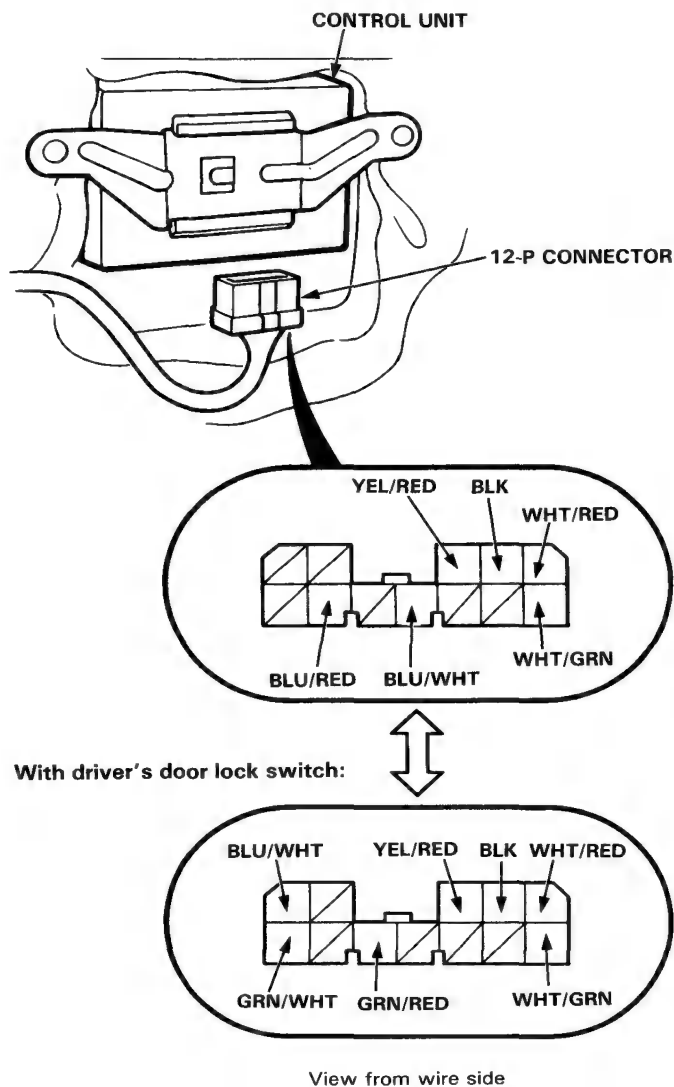
*: with driver's door lock switch.

Power Door Locks

Control Unit Input Test

1. Remove the driver's door panel, then disconnect the 12-P connector from the control unit.
2. Make the following input tests at the connector terminals.

NOTE: Recheck the connections between the 12-P connector and the control unit, then replace the control unit if all input tests prove OK.





No.	Terminal	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G551, G552). • An open in the wire.
2	WHT/GRN	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 6 (20 A) fuse. • An open in the wire.
3	BLU/RED	Driver's door lock knob in UNLOCK.	Check for voltage to ground: it should go from battery voltage to 1 V or less.	<ul style="list-style-type: none"> • Faulty driver's door switch. • Poor ground (G551, G552). • An open in the wire.
4	BLU/WHT	Driver's door lock knob in LOCK.	Check for voltage to ground: it should go from battery voltage to 1 V or less.	<ul style="list-style-type: none"> • *Faulty driver's door switch or actuator. • Poor ground (G551, G552). • An open in the wire.
5	WHT/RED and YEL/RED	Connect the WHT/GRN terminal to the WHT/RED terminal, and the YEL/RED terminal to the BLK terminal momentarily.	Check door lock operation: All doors should lock as the battery is connected momentarily.	<ul style="list-style-type: none"> • Faulty passenger's door actuator. • *Faulty driver's door actuator. • An open in the wire.
		Connect the WHT/GRN terminal to the YEL/RED terminal, and the WHT/RED terminal to the BLK terminal momentarily.	Check door unlock operation: All doors should unlock as the battery is connected momentarily.	
*6	GRN/WHT	Move the driver's power door lock switch from the neutral position to LOCK.	Check for voltage to ground: it should go from battery voltage to 1 V or less.	<ul style="list-style-type: none"> • Faulty driver's door lock switch. • Poor ground (G551, G552). • An open in the wire. • Short to ground. • Faulty control unit.
*7	GRN/RED	Move the driver's power door lock switch from the neutral position to UNLOCK.		

*: with driver's door lock switch.

CAUTION: To prevent damage to the motor, apply battery voltage only momentarily.

Power Door Locks

Driver's Door Lock Actuator Test (With driver's door lock switch)

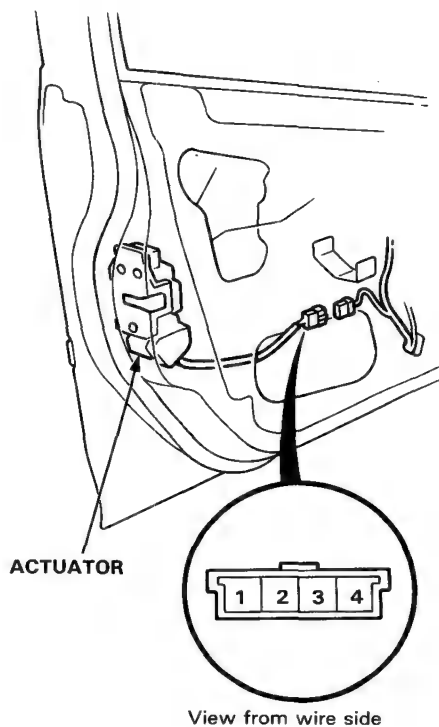
1. Remove the door panel (see Section 20).
2. Disconnect the 4-P connector from the actuator.

3. Test actuator operation:

LOCK: With battery power connected to the No. 4 terminal, ground the No. 3 terminal momentarily.

UNLOCK: With battery power connected to the No. 3 terminal, ground the No. 4 terminal momentarily.

CAUTION: To prevent damage to the motor, apply battery voltage only momentarily.



4. If the actuator fails to operate properly, replace it.

5. Check for continuity between the terminals in each switch position according to the table.

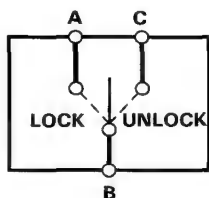
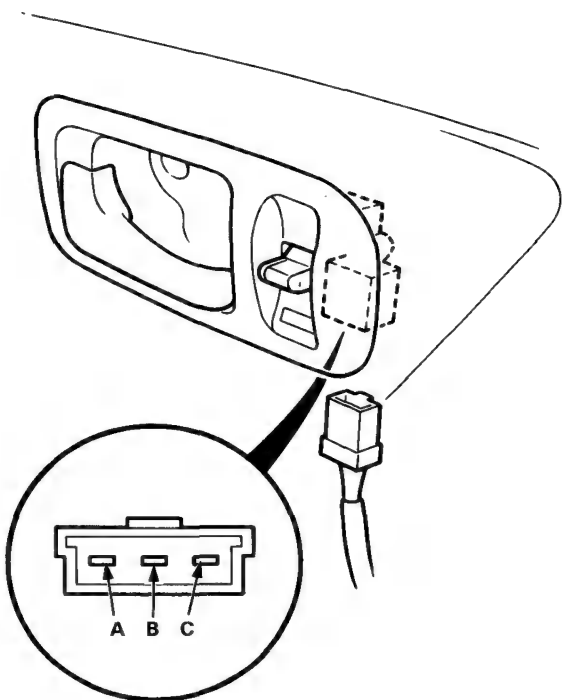
Terminal Position	1	2
LOCK	○	○
UNLOCK		



Driver's Door Lock Switch Test

1. Remove the driver's door panel (see Section 20).
2. Disconnect the 3-P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.

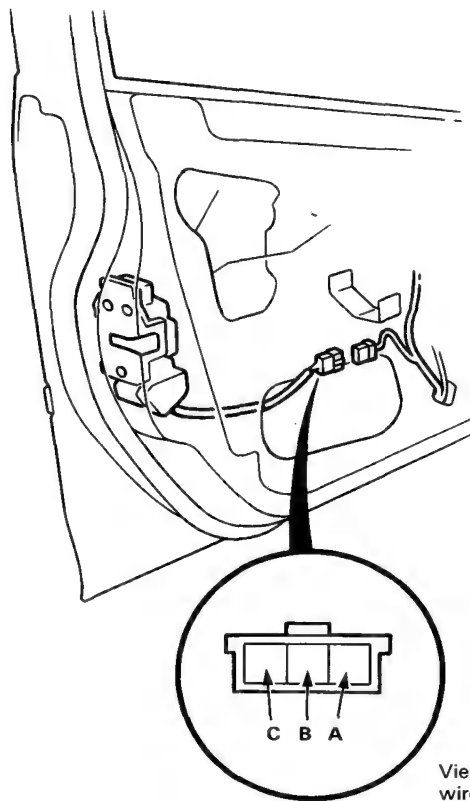
Terminal Position	A	B	C
LOCK	○	○	
OFF			
UNLOCK		○	○



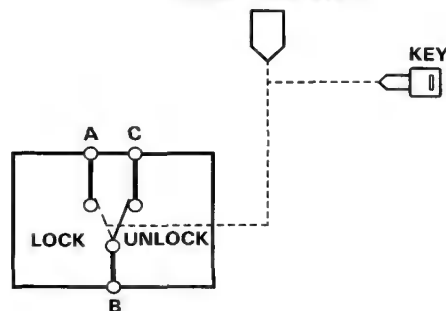
Driver's Door Lock Knob Switch Test

1. Remove the driver's door panel (see Section 20).
2. Disconnect the 3-P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B	C
LOCK		○	○
UNLOCK	○	○	



DOOR LOCK KNOB



Power Door Locks

Passenger's Door Actuator Test

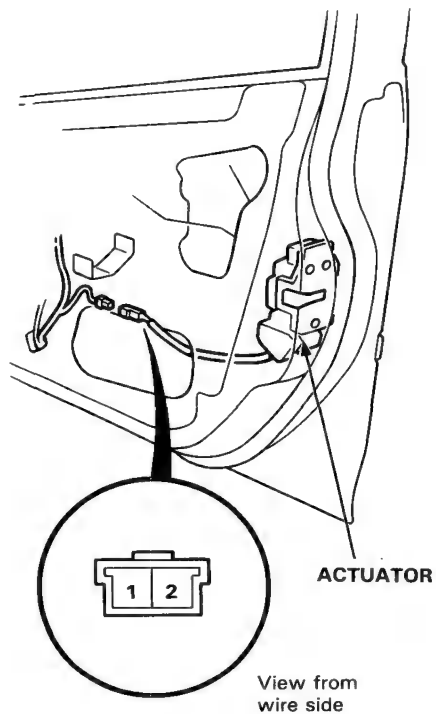
1. Remove the door panel (see Section 20).
2. Disconnect the 2-P connector from the actuator.
3. Test actuator operation:

LOCK: With battery power connected to the No. 1 terminal, ground the No. 2 terminal momentarily.

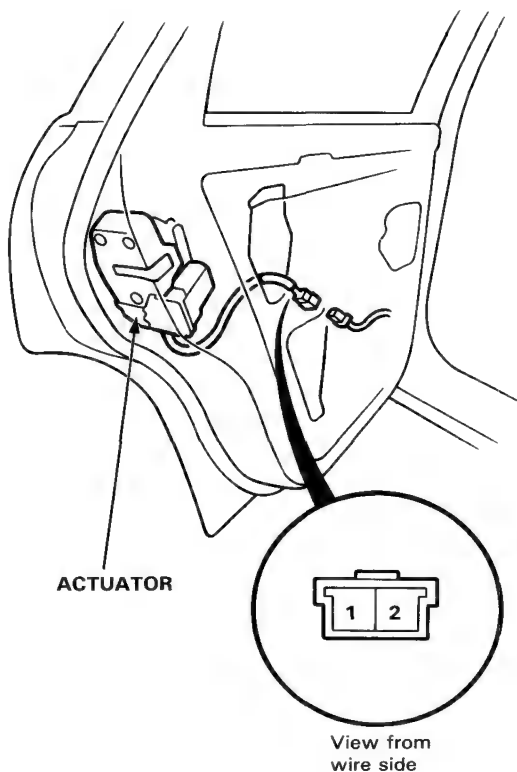
UNLOCK: With battery power connected to the No. 2 terminal, ground the No. 1 terminal momentarily.

CAUTION: To prevent damage to the motor, apply battery voltage only momentarily.

Front Passenger's Door:



Rear Passenger's Door (Sedan):



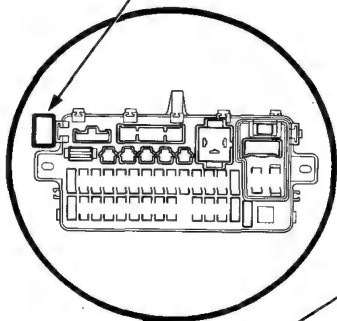
4. If the actuator fails to operate properly, replace it.



Seat Heaters

Component Location Index

SEAT HEATER MAIN RELAY
[Wire colors: BLK/YEL, BLK, WHT/BLK, and BLK/GRN]
Test, page 23-70



SEAT HEATER SWITCHES
Removal, page 23-300
Test, page 23-300

R. SEAT BACK HEATER
Test, page 23-301
Replacement, section 20

L. SEAT BACK HEATER
Test, page 23-301
Replacement, section 20

R. SEAT CUSHION HEATER
Test, page 23-301
Replacement, section 20

R. SEAT HEATER RELAY
Test, page 23-301

L. SEAT CUSHION HEATER
Test, page 23-301
Replacement, section 20

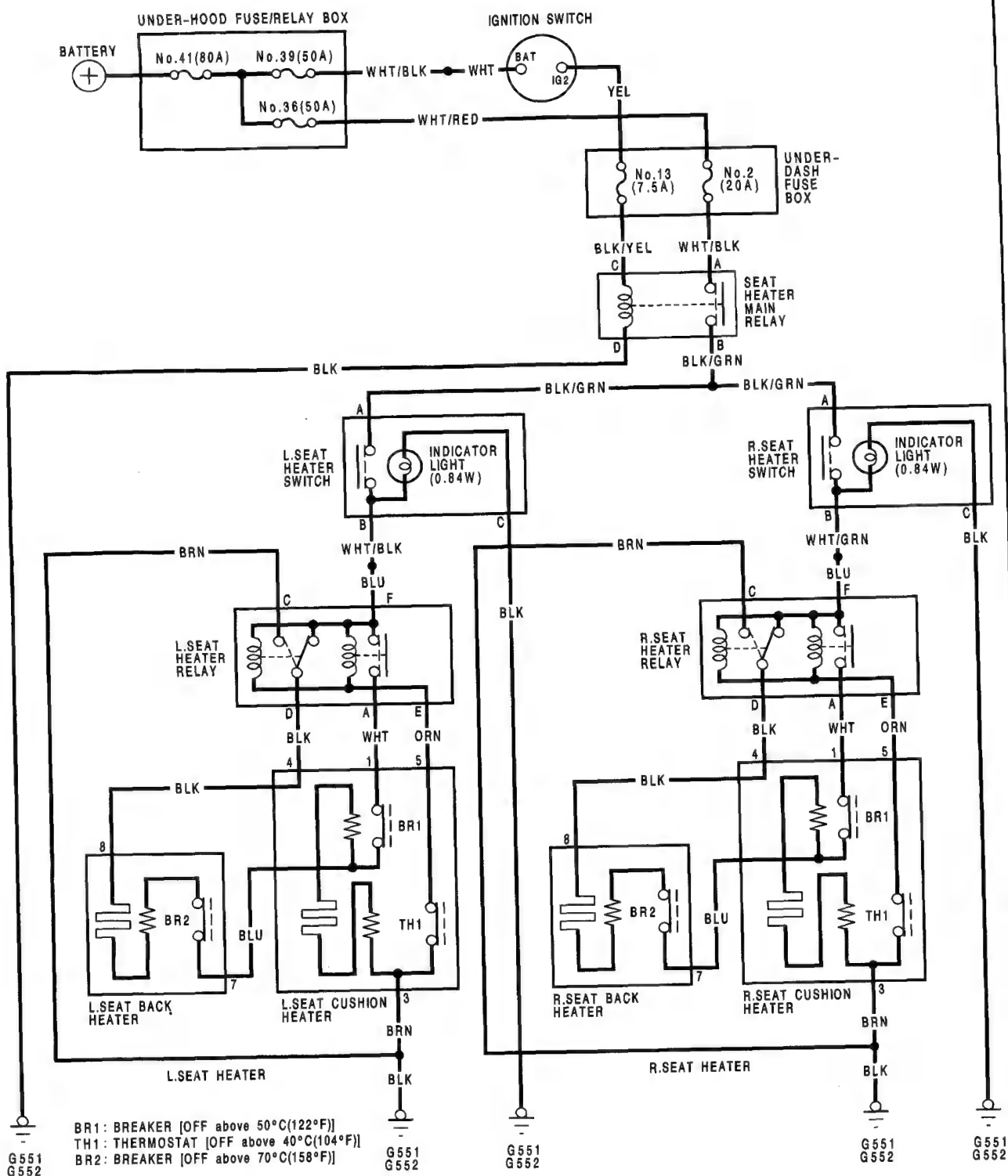
L. SEAT HEATER RELAY
Test, page 23-301

Description

Two heaters are provided in each front seat; one in the seat cushion and one in the seat back. In normal use, temperature is automatically controlled by the thermostat [OFF above 40°C (104°F)] built in each seat cushion heater. In case of an emergency, the breaker 1 [OFF above 50°C (122°F)] and the breaker 2 [OFF above 70°C (158°F)] cut off the circuit to prevent abnormal temperature rise.

Seat Heaters

Circuit Diagram





Troubleshooting

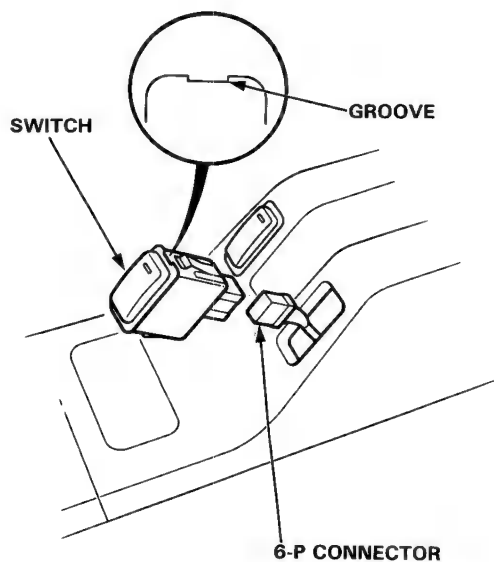
NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected	Blown No. 2 (20 A) fuse (in the under-dash fuse box)	Blown No. 13 (7.5 A) fuse (in the under-dash fuse box)	Blown indicator light bulb	Seat heater switch	Seat heater	Seat heater relay input	Poor ground	Open circuit, loose or disconnect terminals.
Seat heaters operate, but indicator light does not go on.					1				G551 G552	
Seat heaters do not operate and indicator light does not go on.			1			2			G551 G552	BLK/YEL, WHT/BLK
Seat heaters do not operate, but indicator light goes on.	Left and Right seat							1	G551 G552	WHT/BLK, WHT/GRN, BLU, BLK, WHT, ORN
Seat cushion heater or seat back heater does not operate, but indicator light goes on.						1				

Seat Heaters

Switch Removal

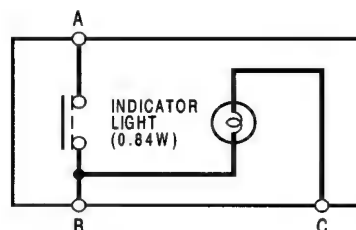
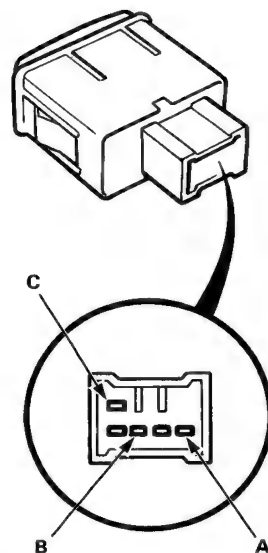
1. Pry the switch out of the console.
2. Disconnect the 6-P connector to remove the switch.



Switch Test

1. Pry the seat heater switch out of the console.
2. Check for continuity between the terminals according to the table.

Terminal	A		B		C
Position					
ON	○	—	○	—	○
OFF			○	—	○

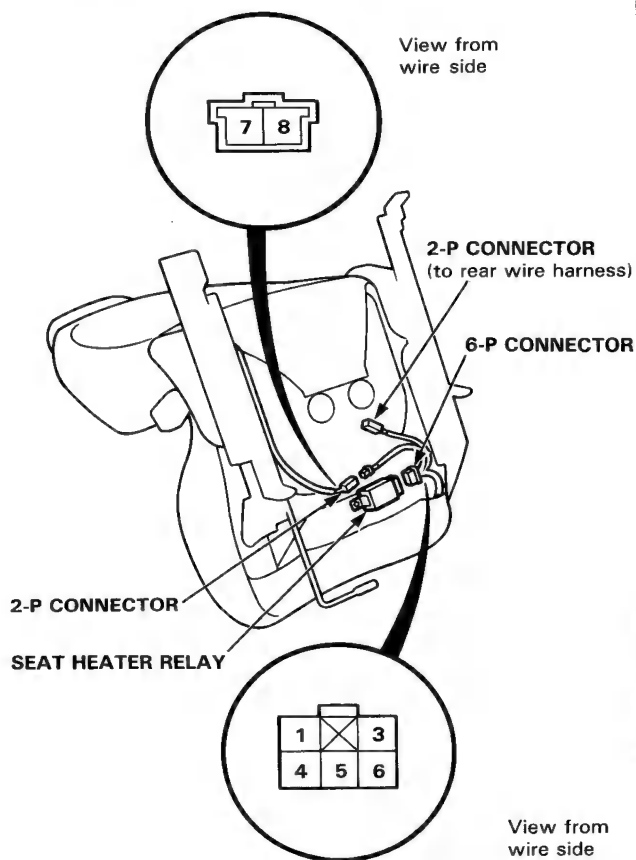




Heater Test

1. Disconnect the 6-P connector and 2-P connector as shown below.

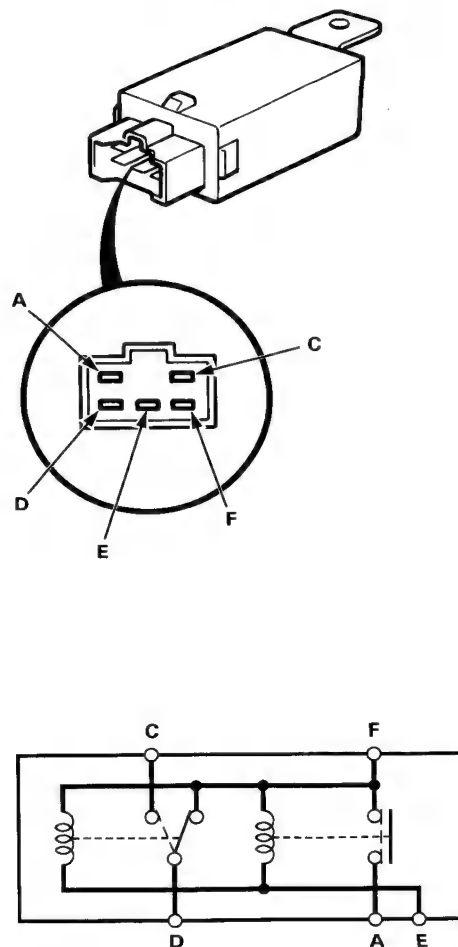
NOTE: Right front seat is shown. Left front seat is similar.



2. Check for continuity between the No. 1 and No. 5 terminals, and between the No. 7 and No. 8 terminals ($R \times 10^3$ scale). There should be continuity.

Heater Relay Test

1. Remove the front seat, then remove the relay from the bottom of the seat.
2. There should be continuity between the F and A terminals, and between the C and D terminals when the battery is connected across the F and E terminals. There should be continuity between the F and D terminals when the battery is disconnected.



Wipers/Washers

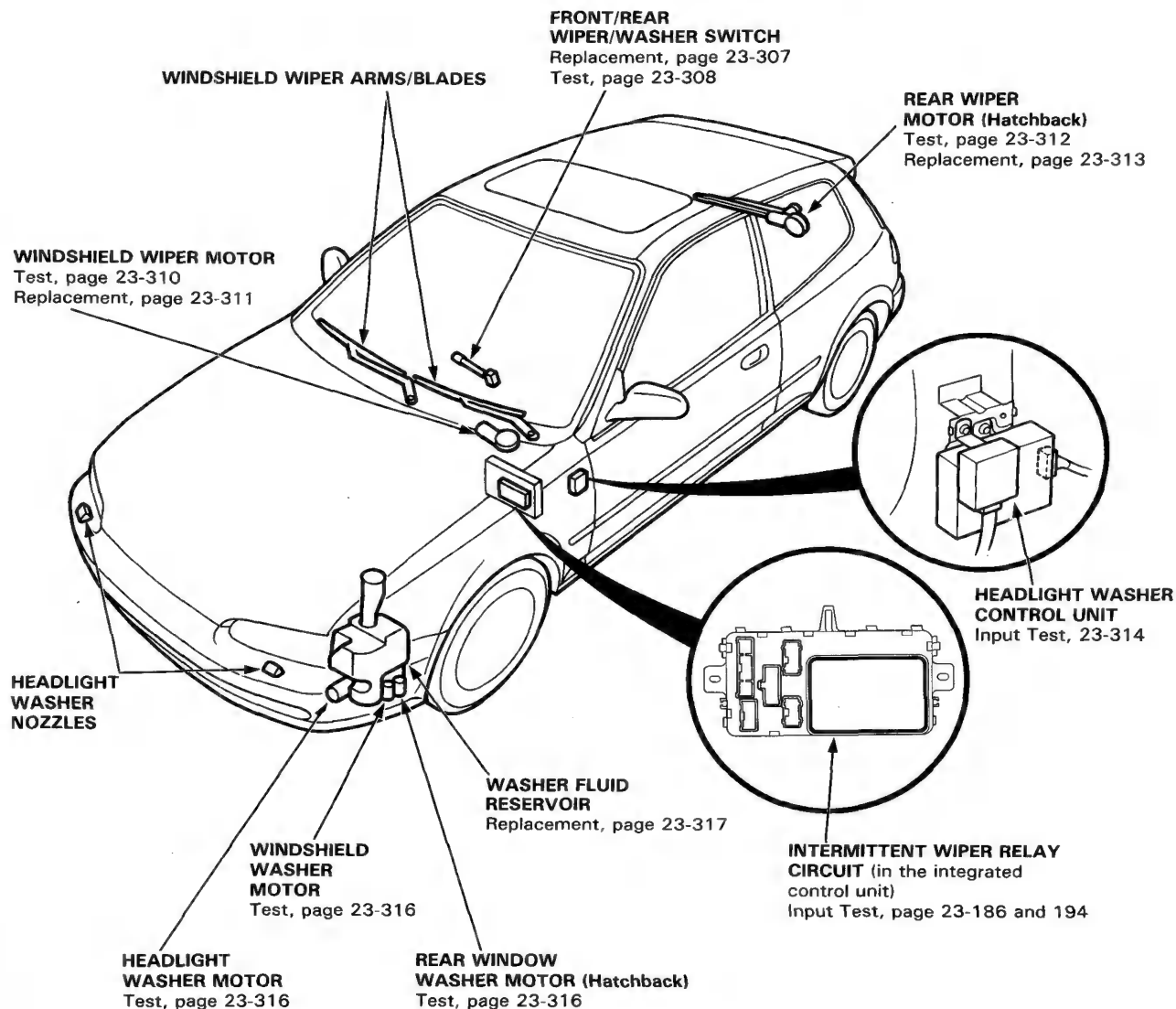
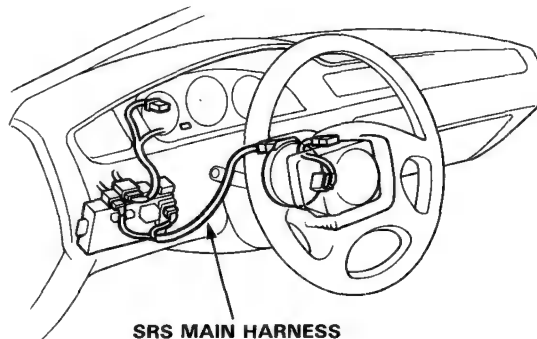
Component Location Index

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE:

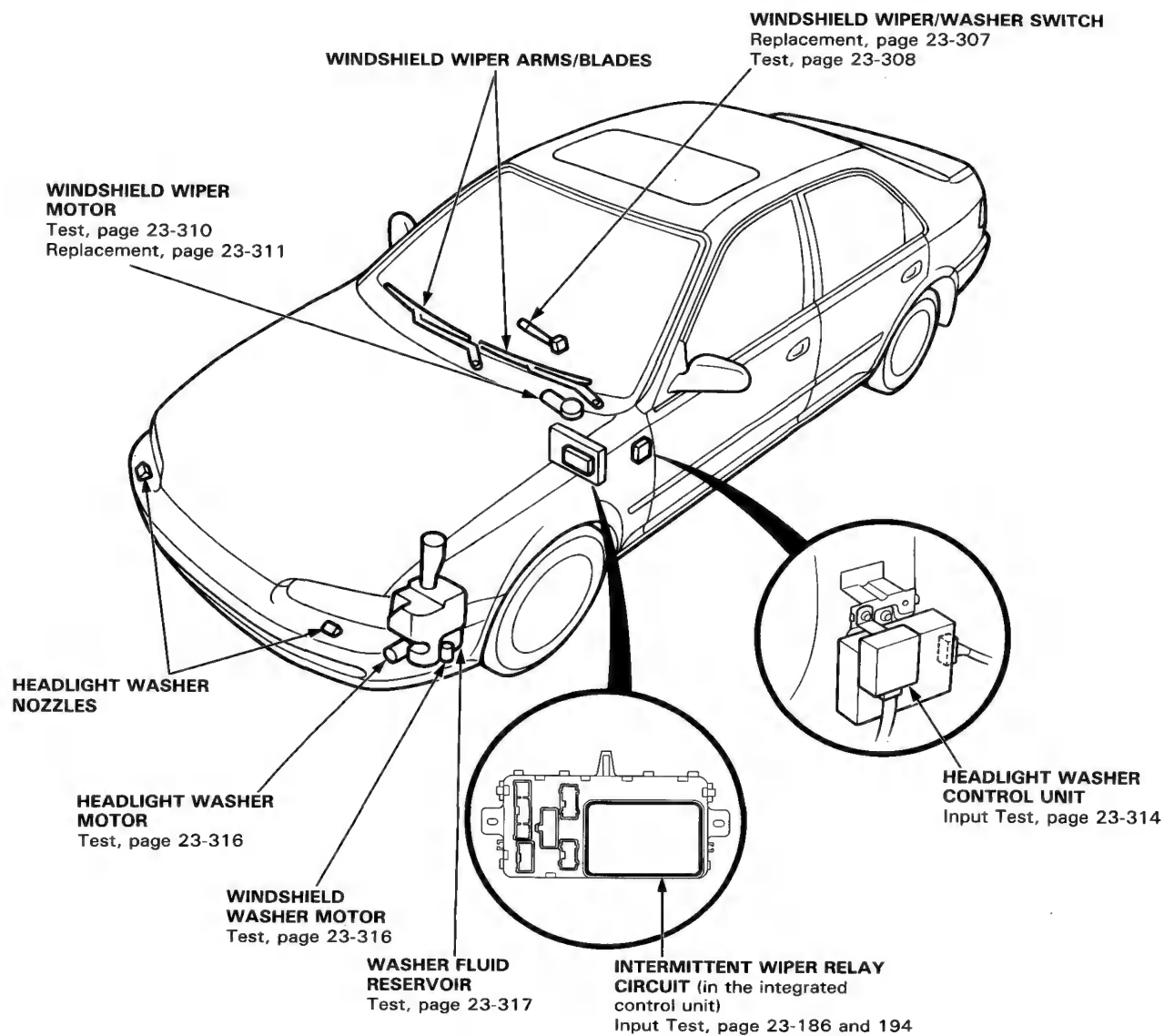
- LHD type is shown; RHD type is symmetrical.
- Some model versions of KG and KS are equipped with headlight washer.





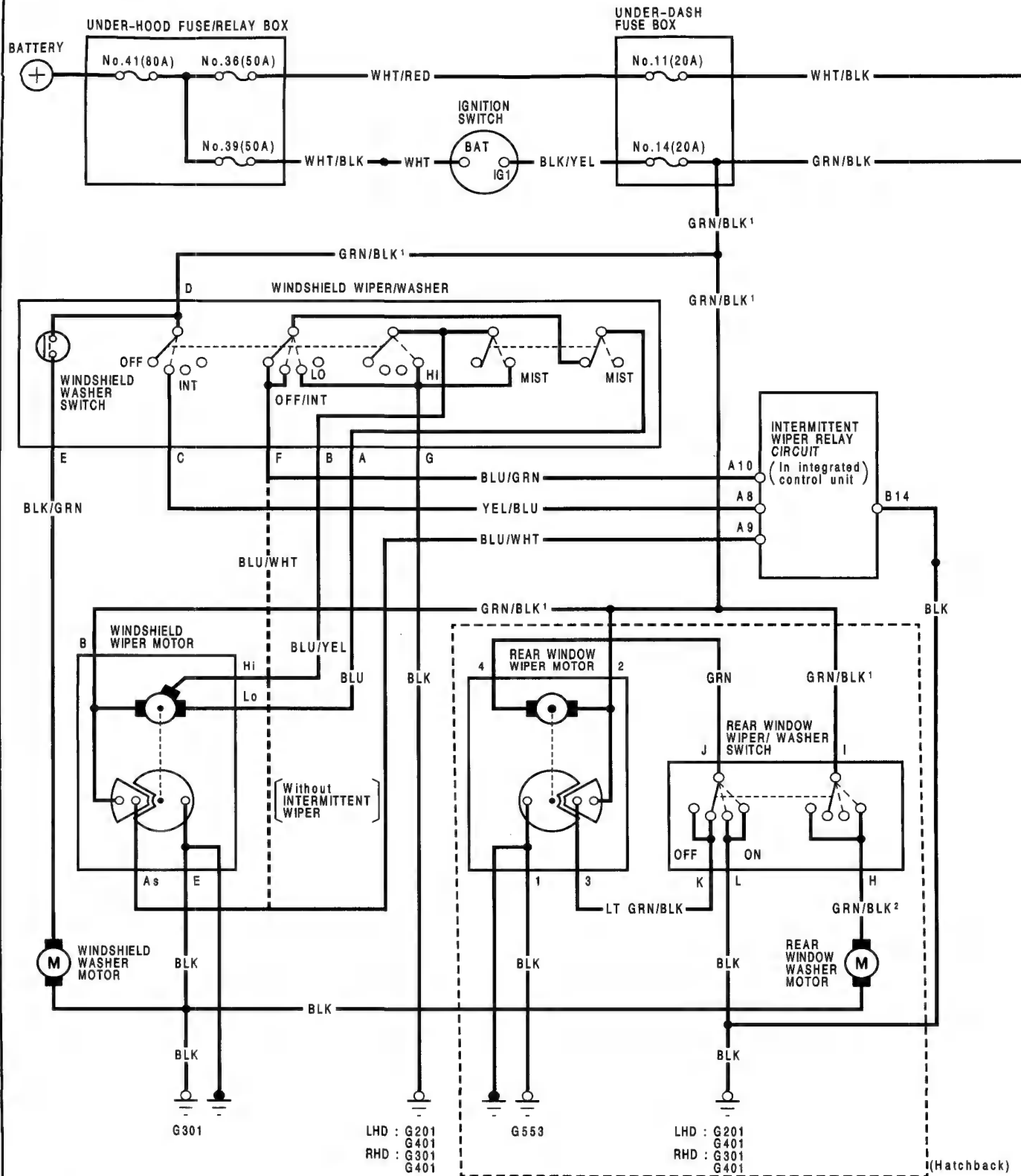
NOTE:

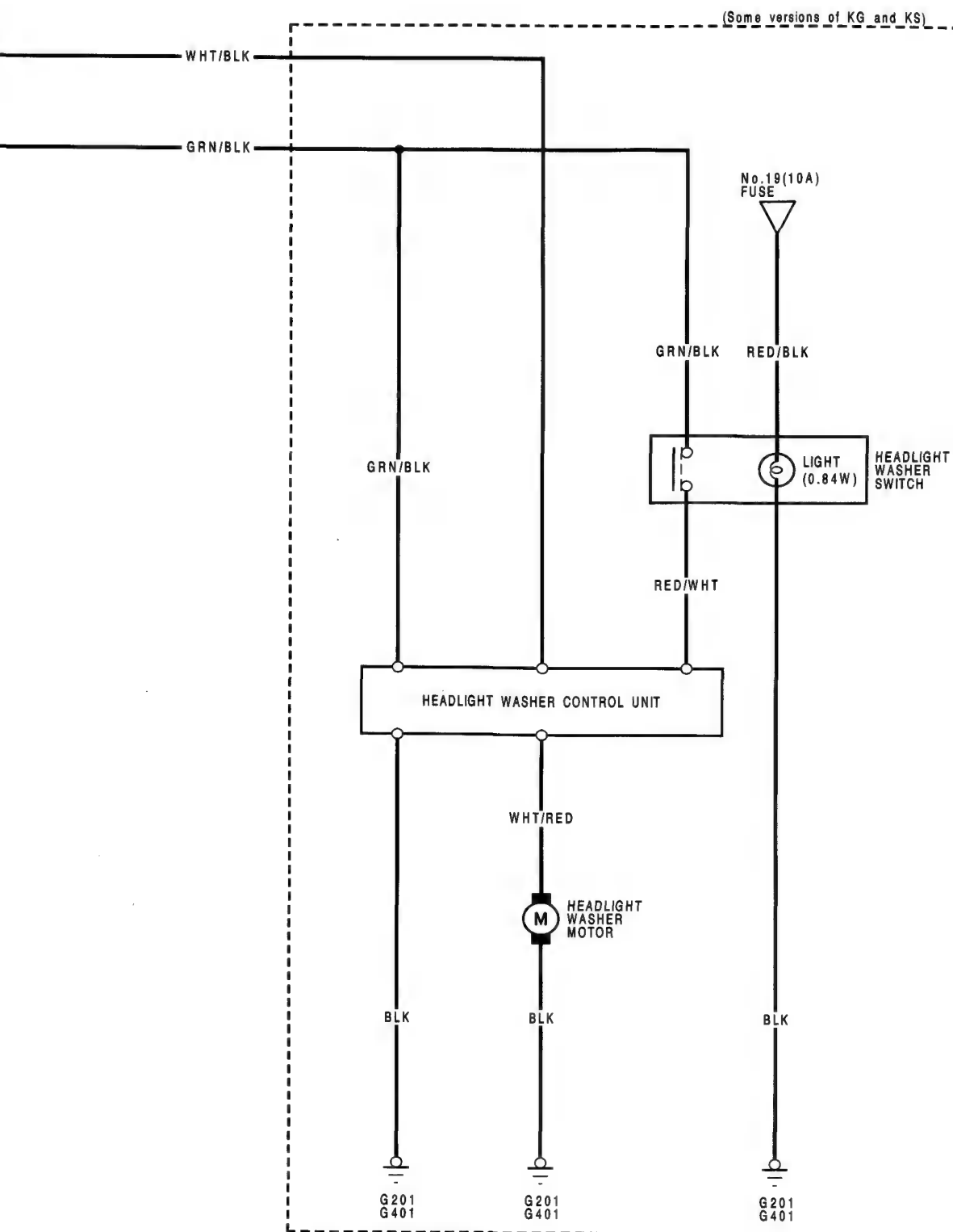
- LHD type is shown; RHD type is symmetrical.
- Some model versions of KG and KS are equipped with headlight washer.



Wipers/Washers

Circuit Diagram





Wipers/Washers

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected		Blown No. 14 (20 A) fuse (in the under-dash fuse box)	Wiper switch	Wiper motor assembly	Washer switch	Washer motor	Intermittent wiper relay circuit (in the integrated control unit)	Insufficient washer fluid in reservoir	Disconnected or blocked washer hose, or clogged outlet	Disconnected wiper linkages	Poor ground	Open circuit in wires, loose or disconnected terminals
Wipers do not operate.	In all positions	1	4	2						3	G*	GRN/BLK ¹
	In INT		1				2					YEL/BLU, BLU/GRN
	In LO or HI		1									
	In Mist		1									
Rear window wiper does not operate.		1	3	2							G, G553	GRN/BLK ¹ , GRN
Blades do not return to park position when wipers are turned OFF.			2	1							G301, *G553	BLU/WHT, LT GRN/BLK
Erratic intermittent cycle or wipers do not operate intermittently.			1				2					BLU/WHT, YEL/BLU, BLU/GRN
Little or no washer fluid is pumped.					4	3		1	2		G301	GRN/BLK ² , BLK/GRN

*: Hatchback

G*: G201 (LHD)

G301 (RHD)

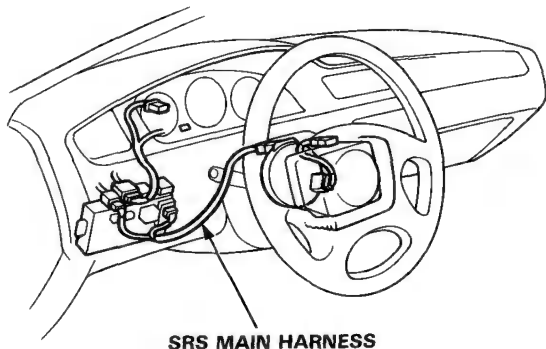
G401



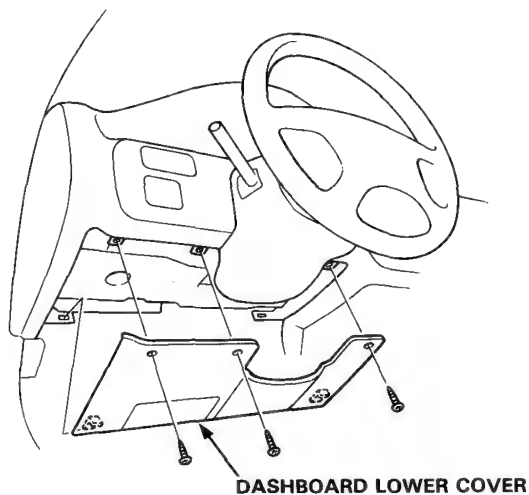
Front/Rear Wiper/Washer Switch Replacement

CAUTION (with SRS):

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



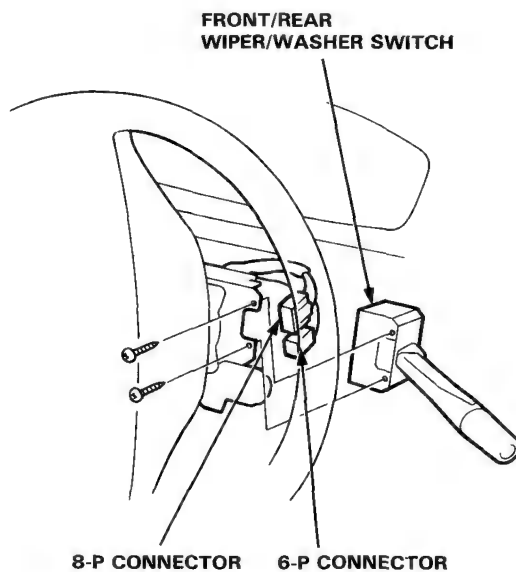
1. Remove the dashboard lower cover.



2. Remove the steering column covers.



3. Disconnect the 8-P and 6-P connectors from the switch, remove the two screws, and pull out the switch.



Wipers/Washers

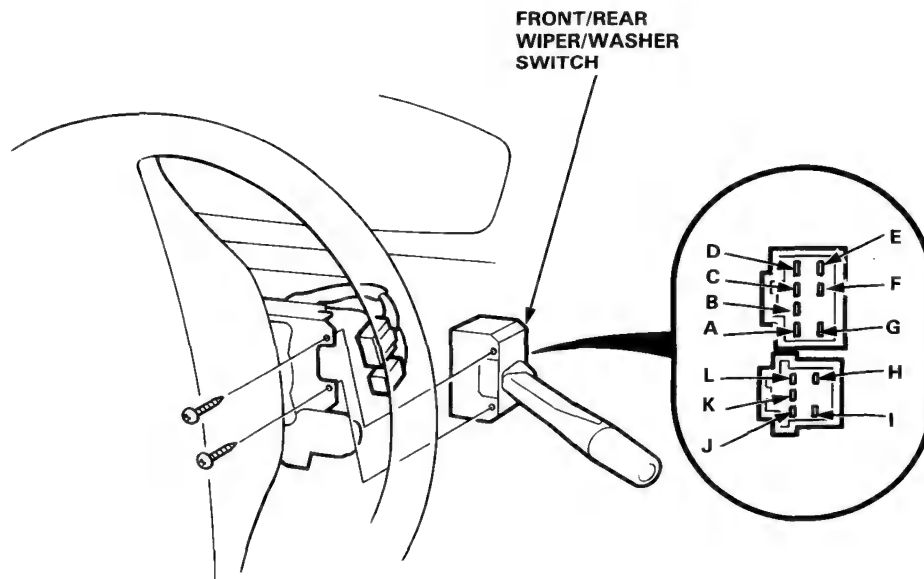
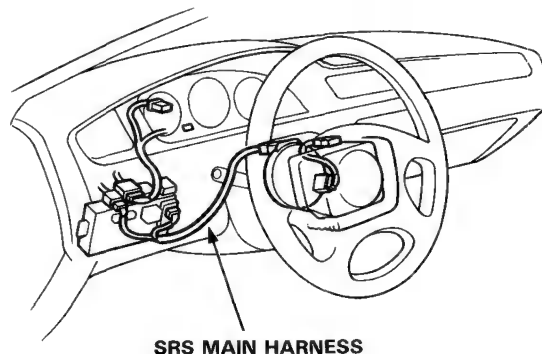
Front/Rear Wiper/Washer Switch Test

CAUTION (with SRS):

- All SRS electrical wire harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

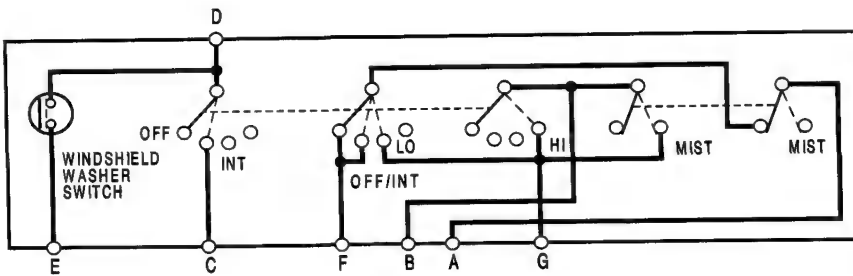
NOTE: LHD type is shown; RHD type is symmetrical.

1. Remove the dashboard lower cover.
2. Remove the steering column covers.
3. Disconnect the 8-P and 6-P connectors from the switch, remove the two screws, and pull out the switch.
4. Check for continuity between the terminals in each switch position according to the table.

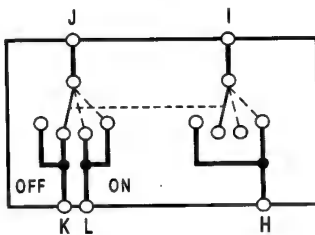




Windshield Wiper/Washer Switch



Rear Window Wiper/Washer Switch



Windshield Wiper/Washer Switch

Terminal Position	A	B	C	D	E	F	G
OFF							
INT							
LO							
HI							
Mist switch "ON"							
Washer switch "ON"							

Rear Window Wiper/Washer Switch

Terminal Position	H	I	J	K	L
OFF					
Washer switch "ON"					
ON					
Washer switch "ON"					

Wipers/Washers

Windshield Wiper Motor Test

1. Open the hood and remove the cap nuts and the wiper arms.
NOTE: Carefully remove the wiper arms so that they do not touch the hood.

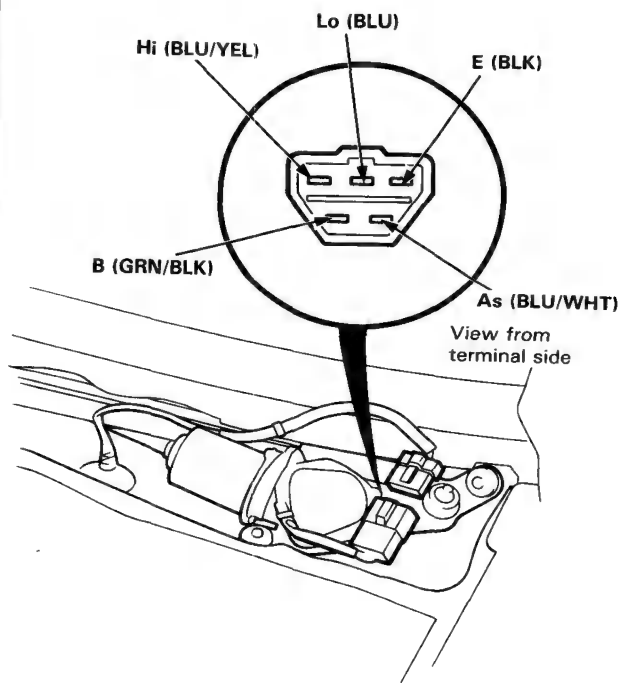
2. Remove the hood seal and air scoop by prying out their trim clips.

3. Disconnect the 5-P connector from the wiper motor assembly.

4. Test motor operation:

LOW SPEED: Connect battery power to the B (GRN/BLK) terminal and ground to the Lo (BLU) terminal.

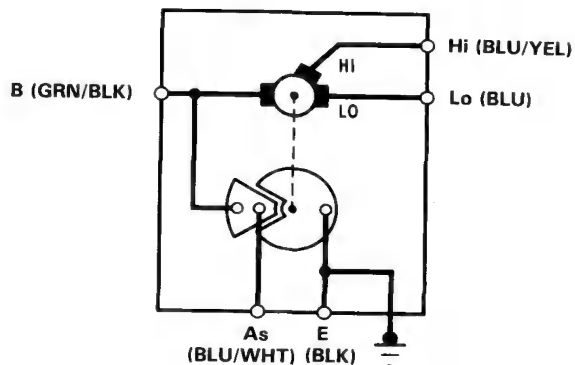
HIGH SPEED: Connect battery power to the B (GRN/BLK) terminal and ground to the Hi (BLU/YEL) terminal.



5. If the motor fails to run smoothly, replace it.

6. Reconnect the 5-P connector to the wiper motor assembly.

7. Connect an analog voltmeter between the As (BLU/WHT) and the E (BLK) terminals. Run the motor by turning the wiper switch ON (Lo or Hi position).



The voltmeter should alternately indicate 0 V and more than 4 V.

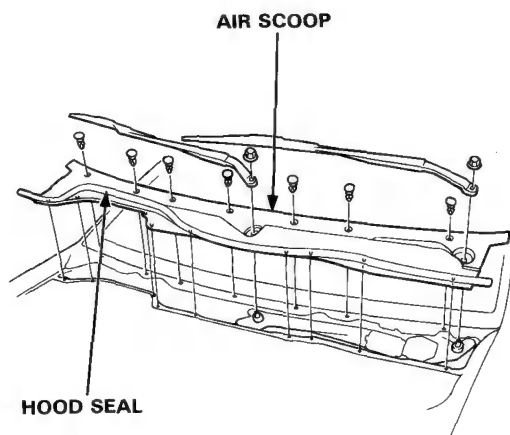


Windshield Wiper Motor Replacement

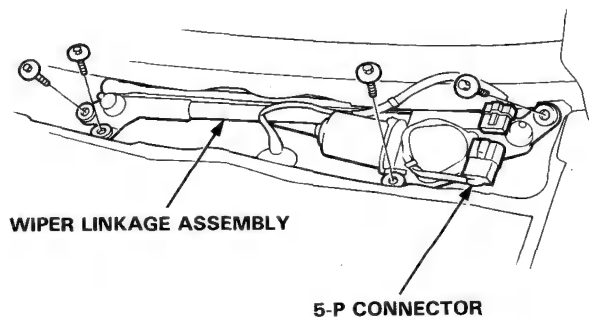
1. Open the hood and remove the cap nuts and the wiper arms.

NOTE: Remove the wiper arms carefully so that they do not touch the hood.

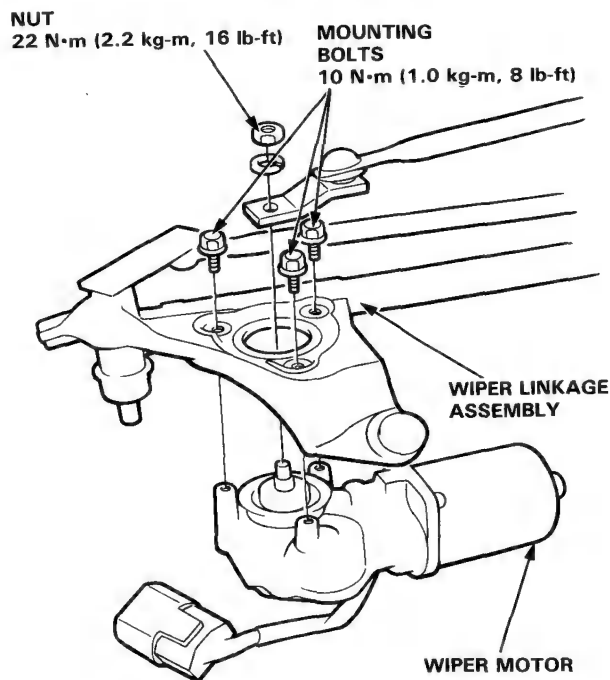
2. Remove the hood seal and air scoop by prying out their trim clips.



3. Disconnect the 5-P connector from the wiper motor, then remove the wiper harness from the wiper linkage.
4. Remove the wiper linkage assembly by removing the 3 mounting bolts.



5. Remove the 3 mounting bolts and 1 nut from the wiper linkage to remove the wiper motor.

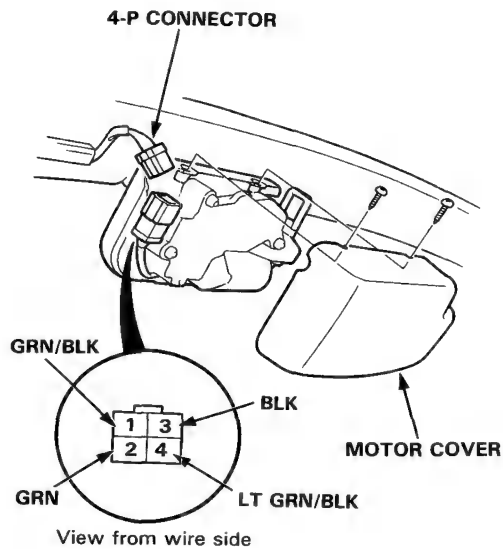


6. Install the wiper motor in the reverse order of removal.

Wipers/Washers

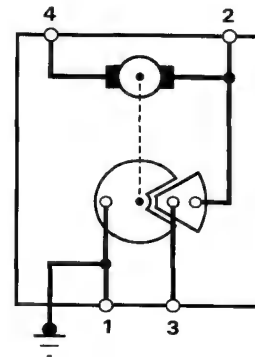
Rear Wiper Motor Test (Hatchback)

1. Open the rear hatch and remove the wiper motor cover.
2. Disconnect the 4-P connector from the wiper motor assembly.
3. Test motor operation by connecting battery power to the No. 11 (GRN/BLK) terminal and ground to the No. 2 (GRN) terminal.



4. If the motor fails to run smoothly, replace it.

5. Reconnect the 4-P connector to the rear wiper motor assembly.
6. Connect an analog voltmeter between the No. 3 (LT GRN/BLK) and the No. 1 (BLK) terminals. Run the motor by turning the wiper switch ON.

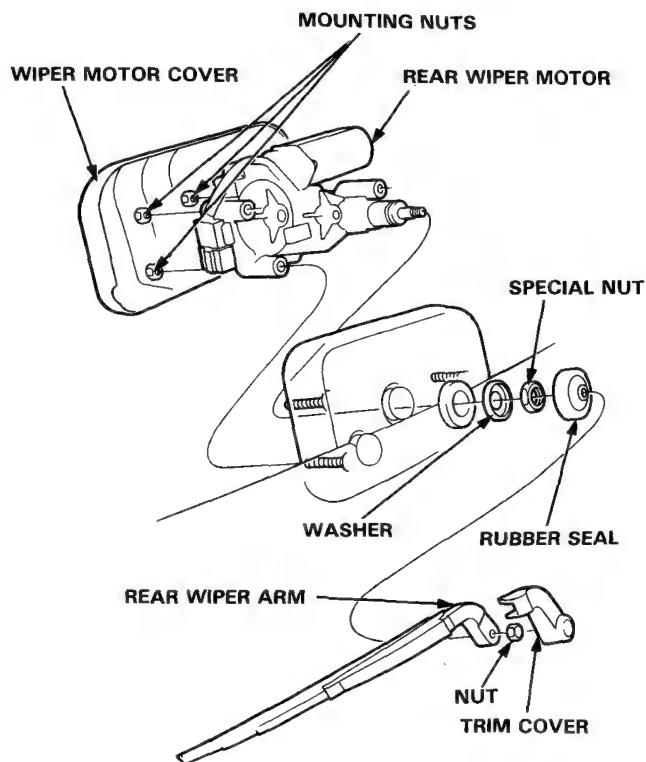


Voltmeter should alternately indicate 0 V and more than 4 V.



Rear Wiper Motor Replacement (Hatchback)

1. Remove the trim cover, nut, and rear wiper arm.
2. Remove the outside rubber seal, special nut, and washer.
3. Open the rear hatch and remove the wiper motor cover.
4. Disconnect the 4-P connector from the wiper motor.
5. While holding the wiper motor with one hand, remove its 3 mounting nuts with the other.



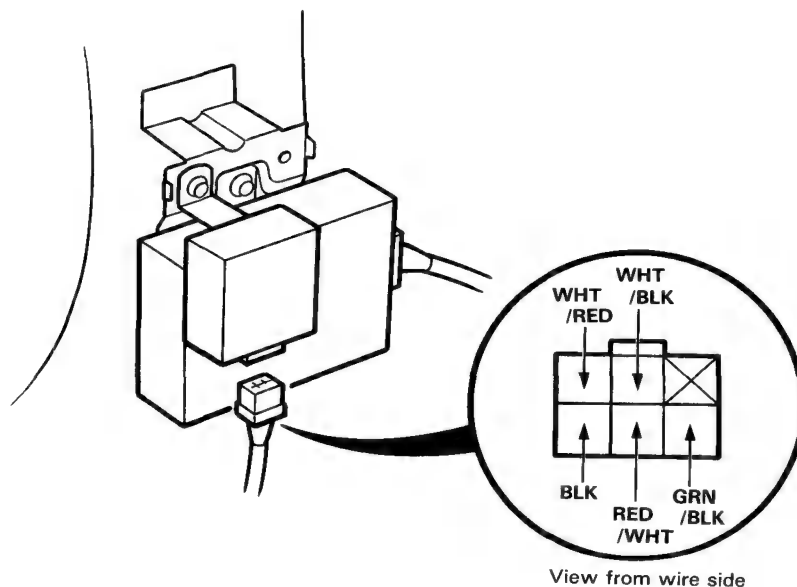
6. Install in the reverse order of removal.

Wipers/Washers

Headlight Washer Control Unit Input Test

NOTE: Some model versions of KG and KS are equipped with headlight washer.

1. Disconnect the 6-P connector from the control unit.
Make the following input tests at the connector terminals. If all tests prove OK, yet the headlight washer still fails to work, replace the control unit.



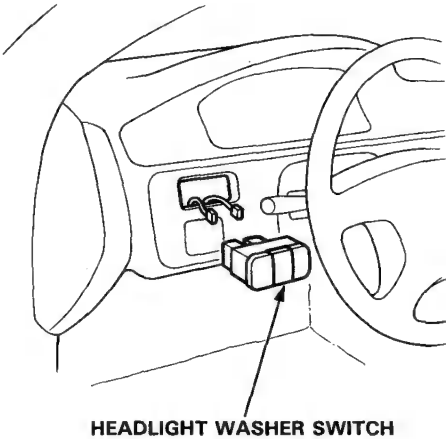
No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201, G401). • An open in the wire.
2	WHT/BLK	Under all conditions.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blow No. 11 (20 A) fuse. • An open in the wire.
3	GRN/BLK	Ignition switch and headlight washer switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blow No. 14 (20 A) fuse. • An open in the wire.
4	RED/WHT			
5	WHT/RED	Connect the WHT/BLK terminal to the WHT/RED terminal with a jumper wire.	Check washer motor operation: washer motor should work.	<ul style="list-style-type: none"> • Faulty headlight washer motor. • Poor ground (G201, G401). • An open in the wire.



Headlight Washer Switch Test

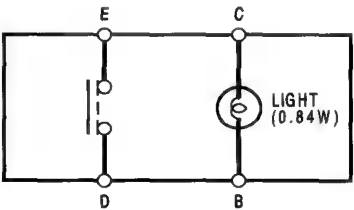
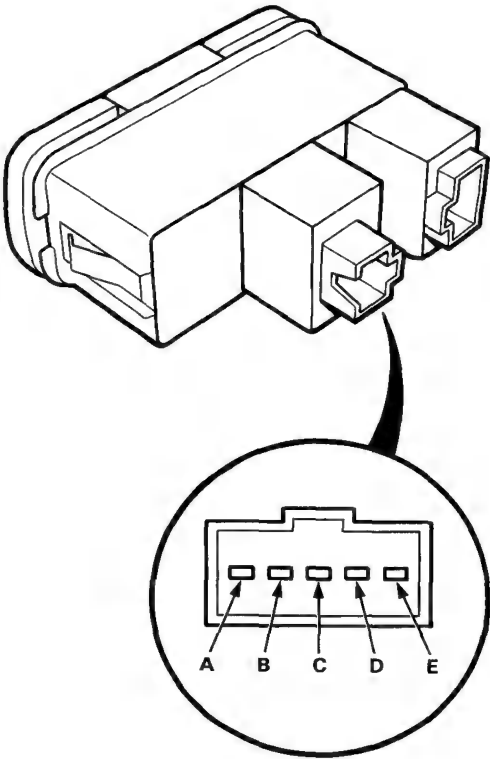
1. Pry the switches out of the instrument panel, then disconnect the connectors.

NOTE: Be careful not to damage the switches and the instrument panel when prying out.



2. Check for continuity between the terminals according to the table.

Terminal Position	A	B		C	D	E
OFF		○	⊖	○		
ON		○	⊖	○	○	○

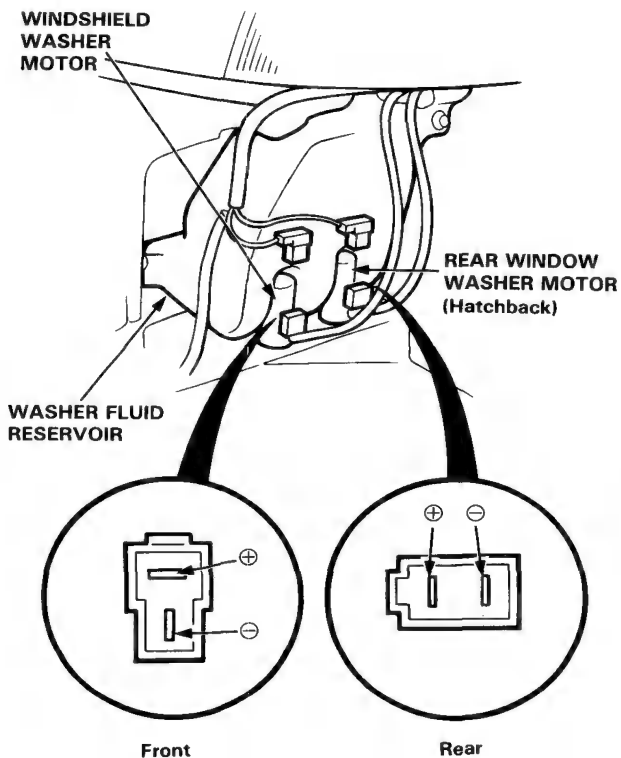
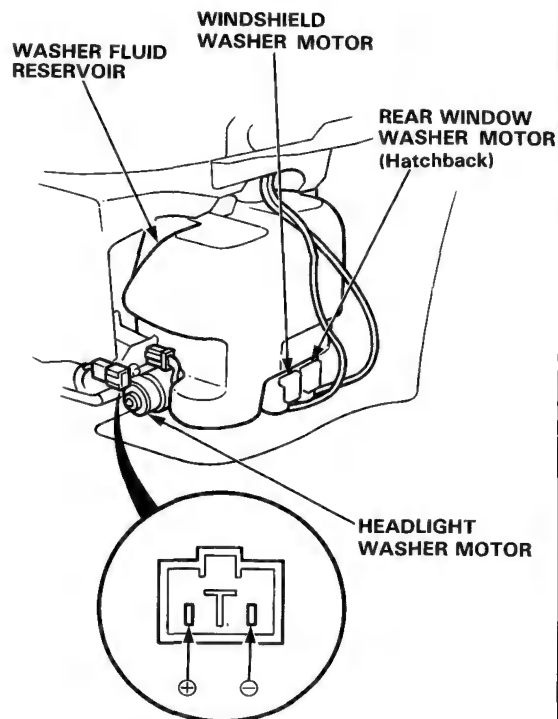


Wipers/Washers

Washer Motor Test

1. Remove the front bumper.
2. Disconnect the 2-P connectors from the washer motors.
3. Test either motor operation by connecting battery power to the \oplus terminal and grounding the \ominus terminal.
 - If the motor fails to run smoothly, replace it.
 - If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

NOTE: Some model versions of KG and KS are equipped with headlight washer.



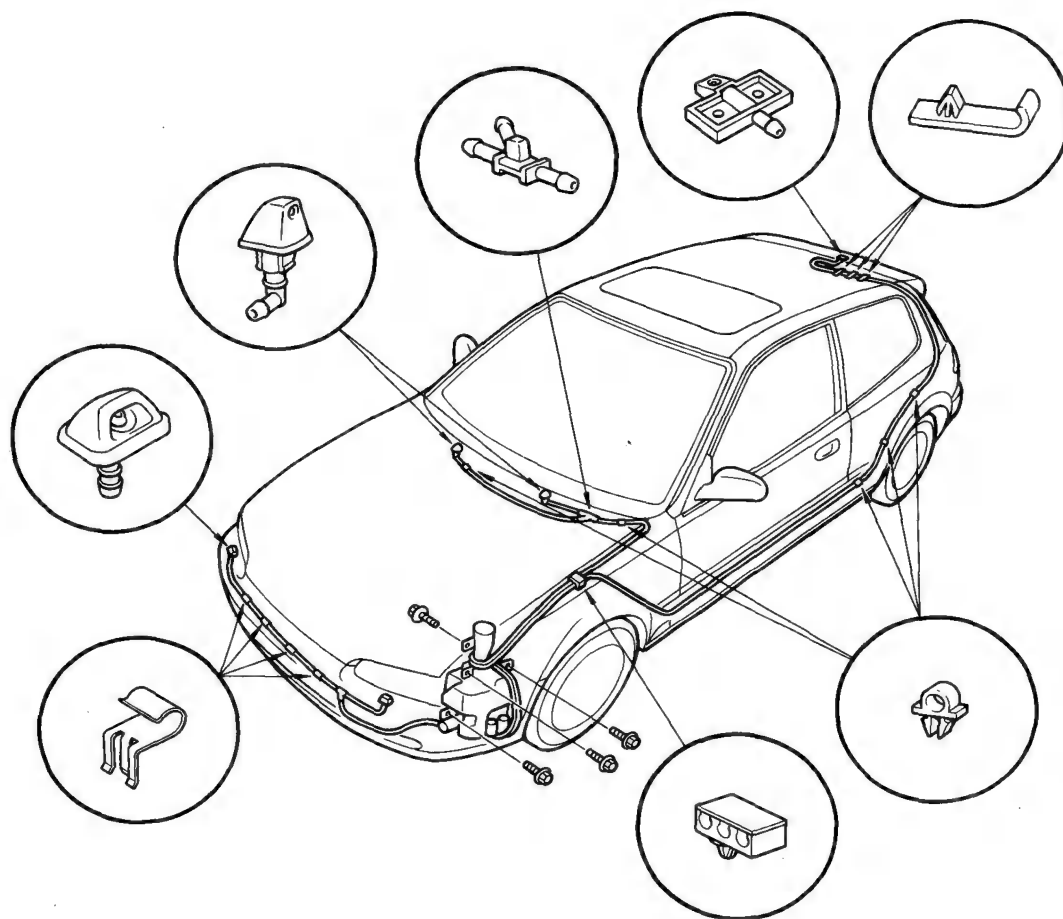


Washers Replacement (Hatchback)

1. Disconnect the receiver dryer line, then remove the receiver dryer (see Section 22).
2. Remove the bumper, then remove the washer reservoir by removing the 3 mounting bolts.
3. Disconnect the hoses and the 2-P connectors from the washer motors.
4. Remove the washer nozzles and washer hoses. (Before removing the rear washer nozzle, remove the rear spoiler).

NOTE:

- Clamp the hoses with the wire harness in the left front fender.
- Take care not to pinch hoses during reinstallation.
- Install the clips firmly.
- After installation, adjust the washer nozzles.



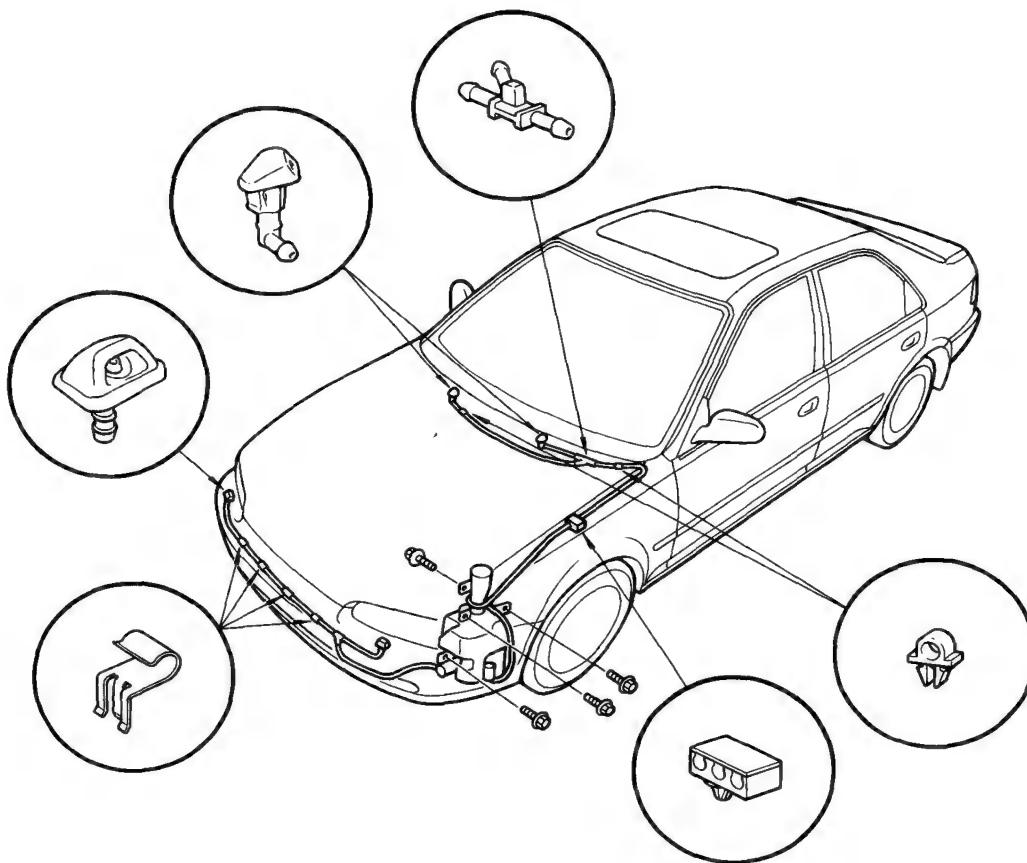
Wipers/Washers

Washers Replacement (Sedan)

1. Disconnect the receiver dryer line, then remove the receiver dryer (see Section 22).
2. Remove the bumper, then remove the washer reservoir by removing the 3 mounting bolts.
3. Disconnect the hoses and the 2-P connectors from the washer motors.
4. Remove the washer nozzles and washer hoses.

NOTE:

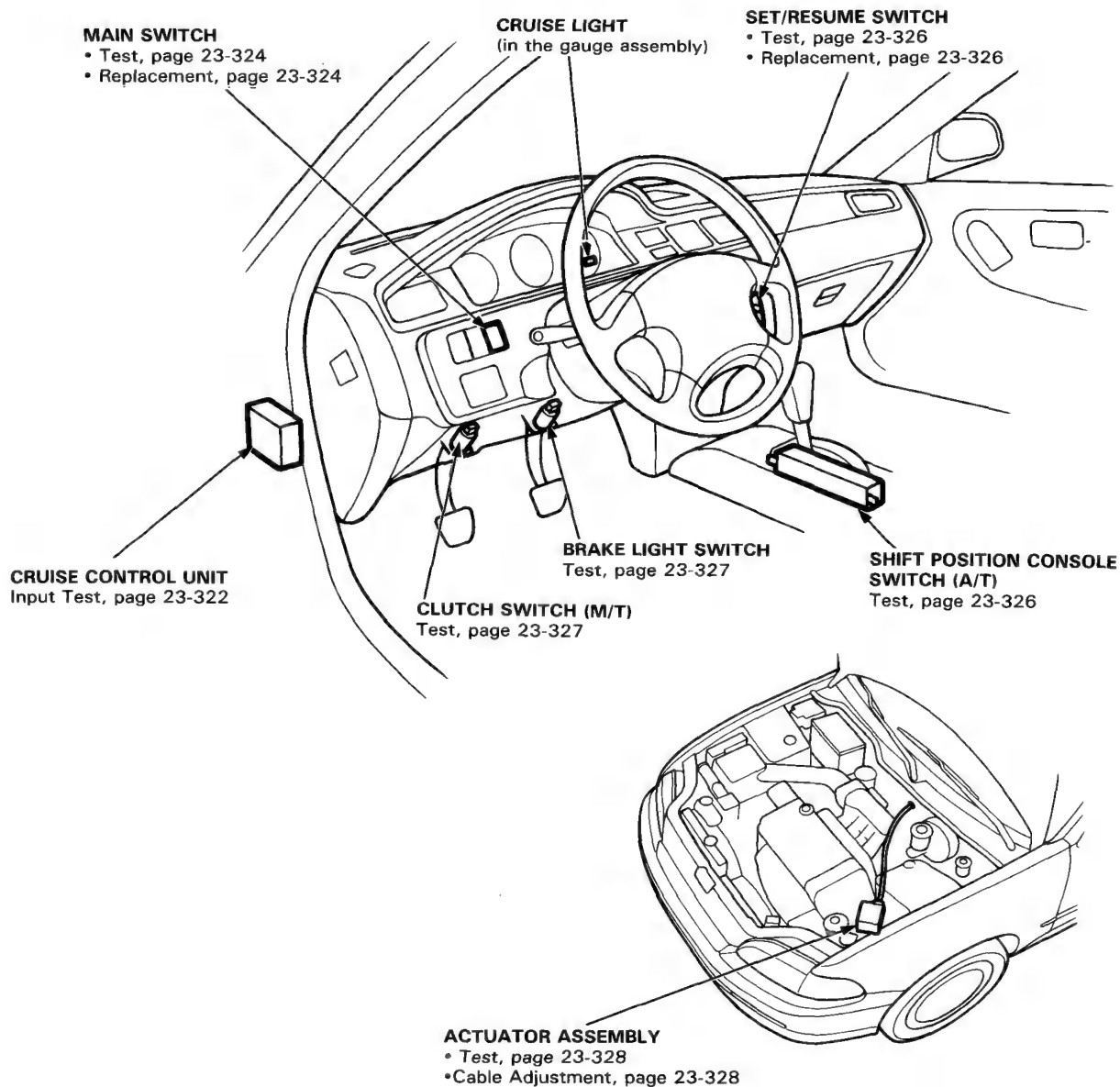
- Clamp the hoses with the wire harness in the left front fender.
- Take care not to pinch hoses during reinstallation.
- Install the clips firmly.
- After installation, adjust the washer nozzles.



Cruise Control

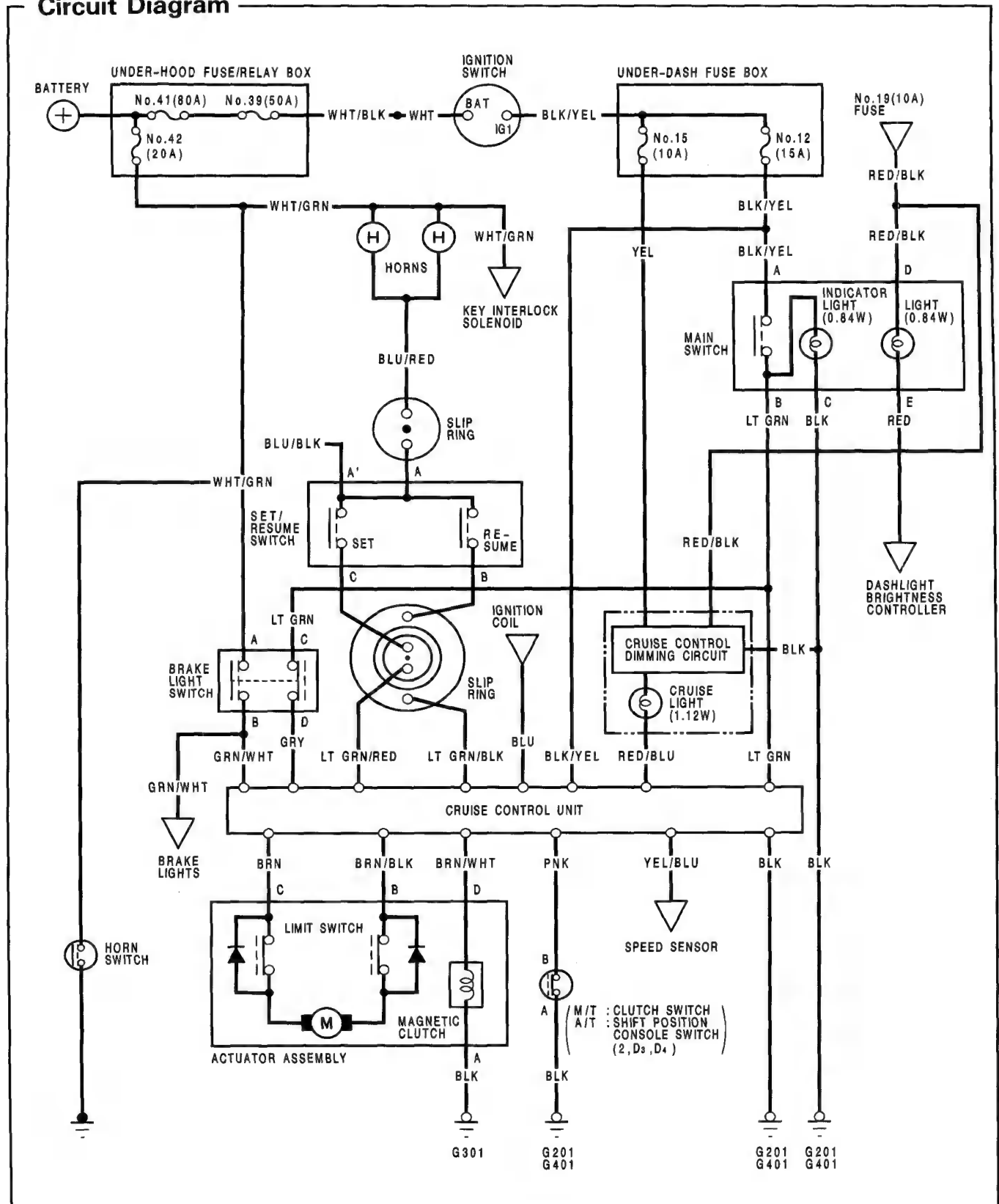


Component Location Index



Cruise Control

Circuit Diagram





Troubleshooting

NOTE:

- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting.
 - Check the No. 15 (10 A) and No. 24 (15 A) or No. 12 (15 A) fuses in the under-dash fuse box, and the No. 41 (80 A), No. 39 (50 A), and No. 42 (20 A) fuses in the under-hood fuse/relay box.
 - Check that the horns sound.
 - Check the tachometer for proper operation.

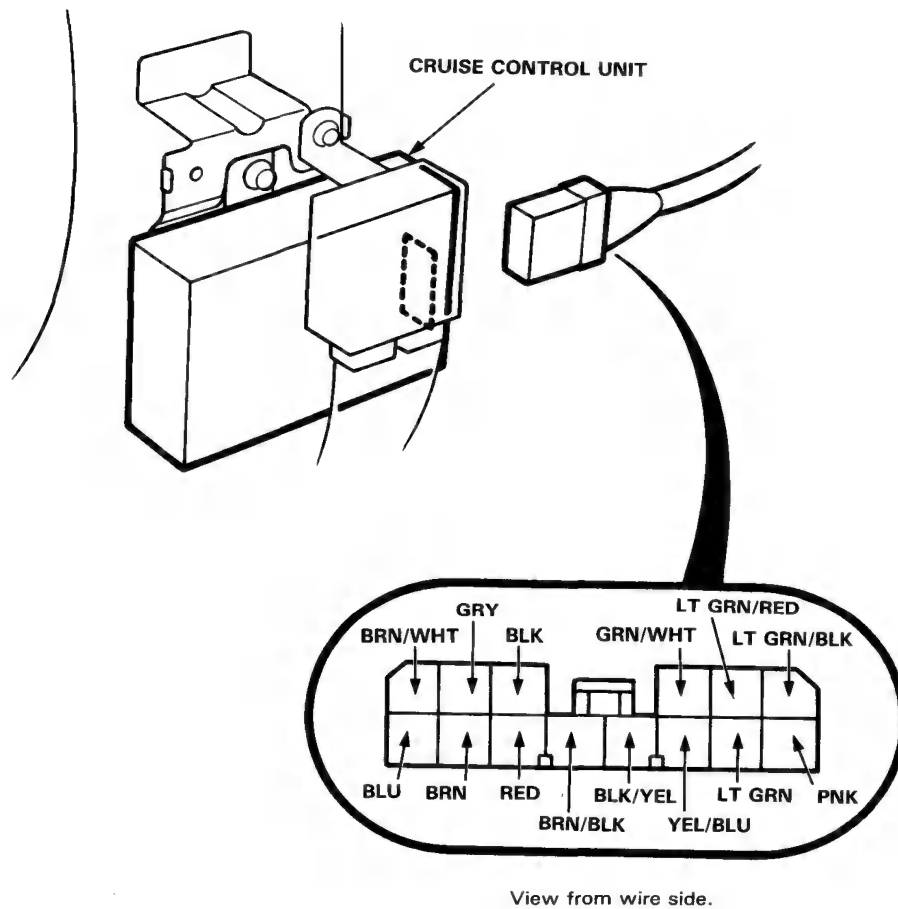
Items to be inspected. Symptom	Main switch	SET/RESUME switch	Brake light switch and mounting	Clutch switch and mounting (M/T)	Shift lever position switch (A/T)	Speed sensor	Dimming circuit in gauges	Actuator and cable deflection	Control unit	Poor ground	Open circuit in wires, loose or disconnected terminals
Cruise control can't be set.	2	3	4	5					1	G301, G201, G401	BLU/RED, LT GRN/RED, BLU, BLK/YEL, LT GRN, GRY, YEL/BLU, BRN, BRN/BLK, BRN/WHT or PNK
Cruise control can be set, but indicator light does not go on.							2		1	G201, G401	YEL or RED/BLU
Cruise speed noticeably higher or lower than what was set.						1		2	3		
Excessive overshooting and/or undershooting when trying to set speed.						2		1	3		
Steady speed not held even on a flat road with cruise control set.						1		2	3		
Car does not decelerate or accelerate accordingly when SET or RESUME button is pushed.		1							2		LT GRN/BLK LT GRN/RED
Set speed not cancelled when clutch pedal is pushed (M/T).				1					2		
Set speed not cancelled when shift lever is moved to N (A/T).					1				2		
Set speed not cancelled when brake pedal is pushed.			1						2		
Set speed not cancelled when main switch is pushed OFF.	1								2		
Set speed not resumed when RESUME button is pushed (with main switch on, but set speed temporarily cancelled).		1							2		LT GRN/BLK LT GRN/RED

Cruise Control

Control Unit Input Test

Disconnect the 14-P connector from the control unit.
Make the following tests at connector terminals.

NOTE: Replace the control unit if it still doesn't work after all input tests prove OK.



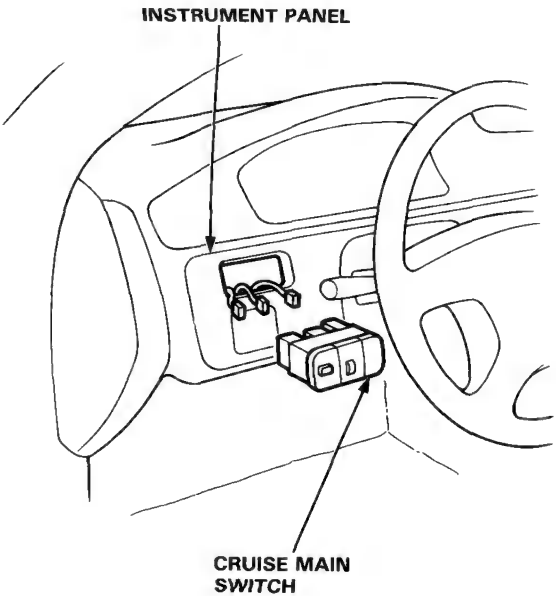


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BLK	Under all conditions.	Check for continuity to ground: there should be continuity.	<ul style="list-style-type: none"> • Poor ground (G201). • An open circuit in the wire (G401).
2	LT GRN	Ignition switch ON and main switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 24 (15 A) fuse. • Faulty main switch. • An open circuit in the LT GRN or BLK/YEL wire.
3	LT GRN/BLK	RESUME button pushed.	Ground each terminal: Horns should sound as the switch is pushed.	<ul style="list-style-type: none"> • Blown No. 42 (20 A) fuse. • Faulty SET/RESUME switch. • Faulty slip ring. • An open circuit in the WHT/GRN, BLU/RED, LT GRN/BLK or LT GRN/RED wire.
4	LT GRN/RED	SET button pushed.		
5	PNK	M/T: Clutch pedal pushed. A/T: Shift lever in 2, D ₃ , or D ₄ .	Check for continuity to ground: there should be continuity. NOTE: There should be no continuity when the clutch pedal is released or when the shift lever is in other positions.	<ul style="list-style-type: none"> • Faulty or misadjusted clutch switch (M/T). • Faulty shift position sensor (A/T). • Poor ground (G201, G401). • An open circuit in the wire.
6	BLU	Start the engine.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Faulty ignition system or PGM-FI ECU. • An open circuit in the wire.
7	YEL/BLU	Ignition switch ON and main switch ON. Raise the front of the car, rotate one wheel slowly.	Check for voltage between the YEL/BLU ⊕ and BLK ⊖ terminals: it should be 0—5—0—5 V repeatedly.	<ul style="list-style-type: none"> • Faulty speed sensor. • An open circuit in the wire. • Short to ground.
8	GRY	Ignition switch ON, main switch ON and brake pedal pushed, then released.	Check for voltage to ground: it should be 0 V with the pedal pushed and battery voltage with the pedal released.	<ul style="list-style-type: none"> • Faulty brake light switch. • An open circuit in the GRY or LT GRN wire.
9	GRN/WHT	Brake pedal pushed, then released.	Check for voltage to ground: it should be battery voltage with the pedal pushed, and 0 V with the pedal released.	<ul style="list-style-type: none"> • Faulty brake light switch. • An open circuit in the wire.
10	RED/BLU	Ignition switch ON.	Attach to ground: Indicator light in the gauge assembly comes on.	<ul style="list-style-type: none"> • Blown bulb. • Blown No. 15 (10 A) fuse. • Faulty dimming circuit in the gauge assembly. • An open circuit in the wire.
11	BRN	Connect the battery positive to the BRN/WHT terminal and negative to the BRN/BLK terminal.	Check the operation of the actuator motor: you should be able to hear the motor.	<ul style="list-style-type: none"> • Faulty actuator. • An open circuit in the wire.
12	BRN/BLK			
13	BRN/WHT	Connect the battery positive to the BRN/WHT terminal.	Check the operation of the magnetic clutch: clutch should click and output link should be locked.	<ul style="list-style-type: none"> • Faulty actuator. • An open circuit in the wire. • Poor ground (G301).
14	BLK/YEL	Ignition switch ON.	Check for voltage to ground: there should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 24 (15 A) fuse. • An open circuit in the BLK/YEL wire.

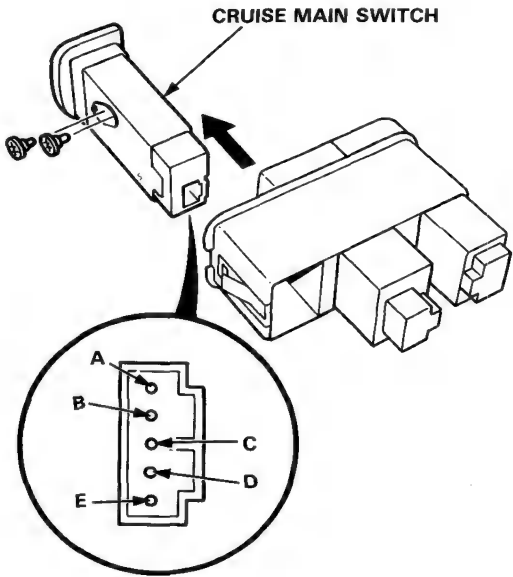
Cruise Control

Main Switch Test

1. Carefully pry the switches out of the instrument panel and disconnect the connector.

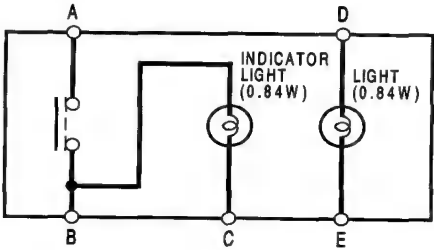


2. Check for continuity between the terminals in each switch position according to the table.



- If there is no continuity, replace the switch.

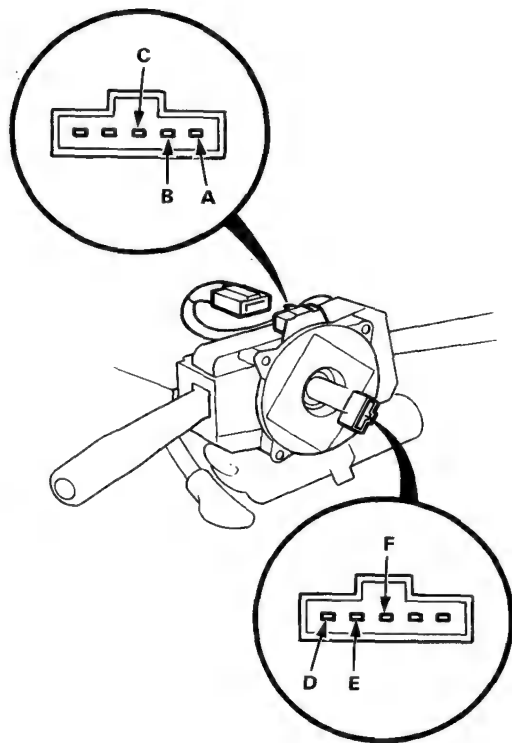
Terminal Position	A	B		C	D		E
OFF		○	○	○	○	○	○
ON	○	○	○	○	○	○	○



Cruise Control

Slip Ring Test

1. Remove the steering wheel.
2. Remove the column covers, then disconnect the 5-P connector from the main wire harness.
3. There should be continuity between the C and F terminal, the B and E terminal, and the A and D terminal, as you turn the slip ring.

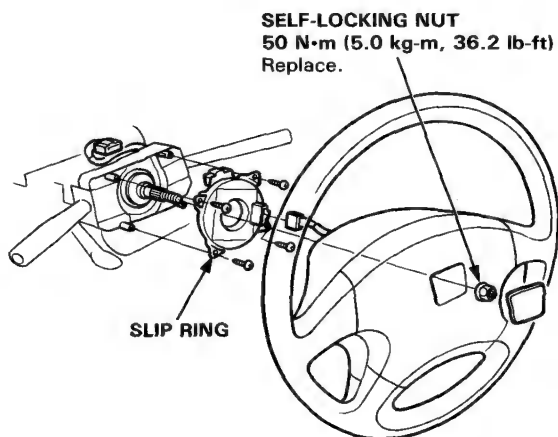


4. If there is no continuity replace the slip ring.



Slip Ring Replacement

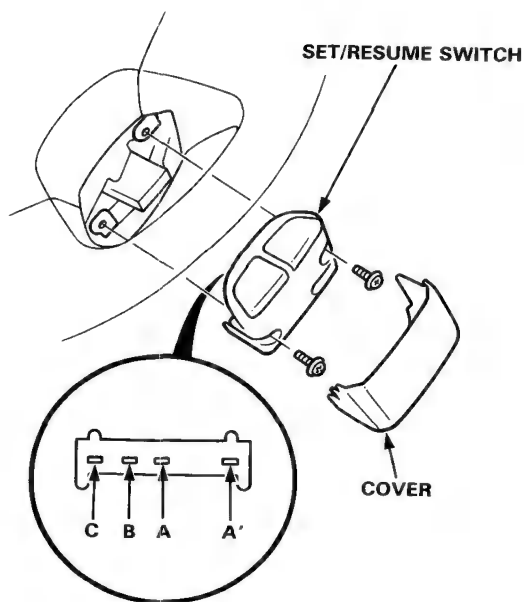
1. Remove the steering wheel.
2. Remove the column covers, then disconnect the 5-P connector from the main wire harness.
3. Remove the 4 screws and the slip ring.



Cruise Control

Set/Resume Switch Test

1. Pry the cover off the Set/Resume Switch and remove the switch by removing its two screws



2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A or A'	B	C
SET (ON)	○	—	○
RESUME (ON)	○	○	—

- If there is no continuity in any position, replace the switch.

Shift Position Console Switch Test

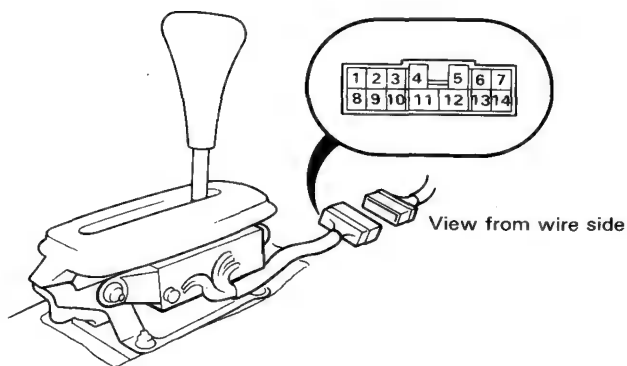
1. Remove the front console, then disconnect the 14-P connector from the console switch.
2. Check for continuity between the terminals in each switch position according to the table.

NOTE:

- Move the lever back and forth not touching the push knob at each position, and check for continuity within the range of free play of the shift lever.
- If there is no continuity within the range of free play, adjust the installation position of the console switch.

Shift Position Switch (for cruise control)

Terminal Position	7	13
1		
2	○	○
D ₃	○	○
D ₄	○	○
N		
R		
P		



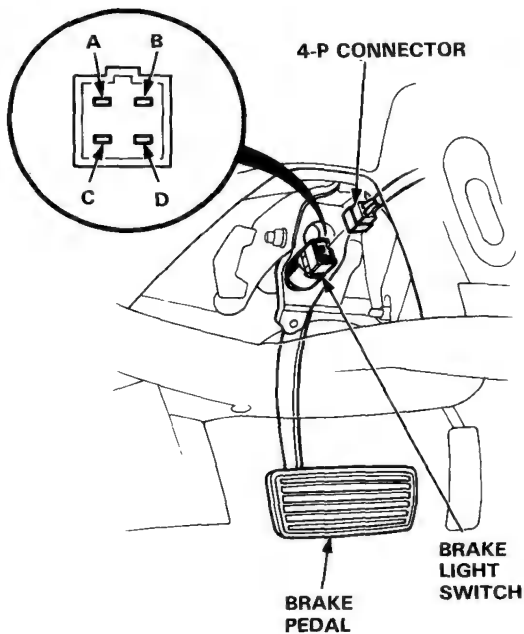
3. If necessary, replace the switch (see page 23-183).



Brake Light Switch Test

1. Disconnect the 4-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B	C	D
Brake pedal				
RELEASED	○			○
PUSHED		○	○	

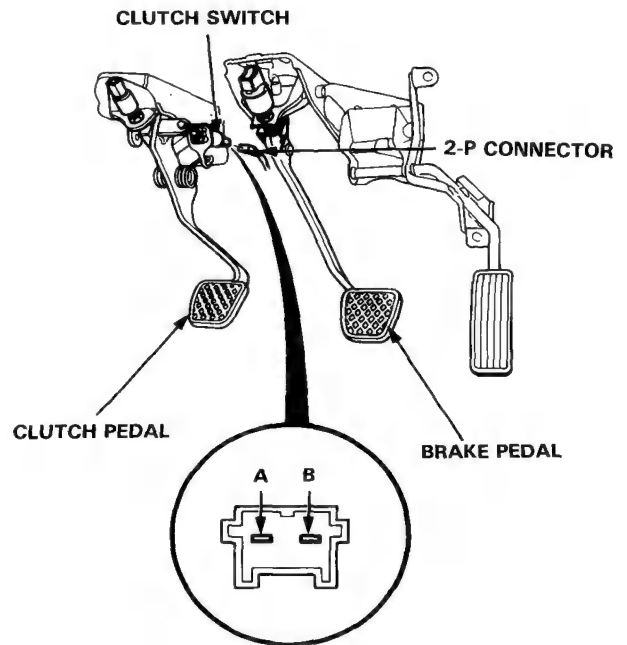


3. If necessary, replace the switch or adjust pedal height (see Section 12).

Clutch Switch Test (M/T)

1. Disconnect the 2-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B
Clutch pedal		
RELEASED	○	○
PUSHED		

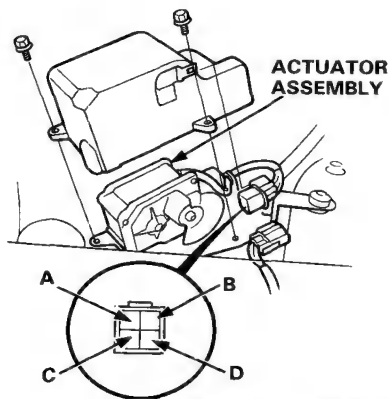


3. If necessary, replace the switch or adjust pedal height (see Section 12).

Cruise Control

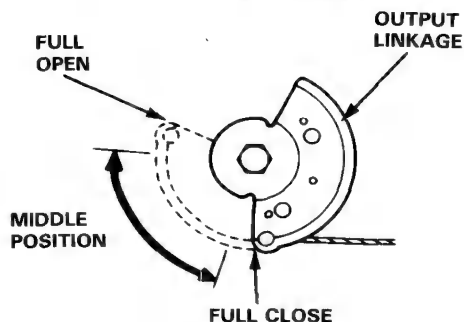
Actuator Assembly Test

1. Disconnect the 4-P connector from the actuator.
2. Check the output linkage for smooth movement.
3. Connect battery power to the D terminal and ground to the A terminal.
4. Check for a clicking sound from the magnetic clutch. The output linkage should be locked. You should be able to hear the motor.
5. If the output linkage is not locked, replace the actuator assembly.



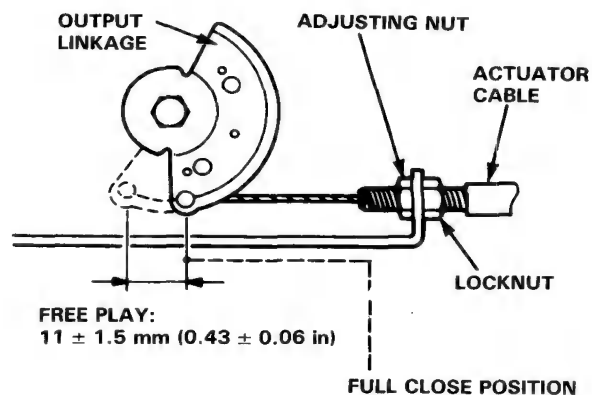
6. Check the operation of the actuator motor in each output linkage position according to the table. You should be able to hear the motor.

Battery polarities		Output linkage position		
⊕	⊖	FULL CLOSE	MIDDLE POSITION	FULL OPEN
C Terminal	B Terminal	The motor operates	The motor operates	The motor stops
B Terminal	C Terminal	The motor stops	The motor operates	The motor operates



Actuator Cable Adjustment

1. Check that the actuator cable operates smoothly with no binding or sticking.
2. Start the engine and warm it up to normal operating temperature (the cooling fan comes on twice).
3. Measure the amount of movement of the output linkage until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position. Free play should be 11 ± 1.5 mm (0.43 ± 0.06 in).



4. If the free play is not within specs, loosen the locknut and turn the adjusting nut as required.

NOTE: If necessary, check the throttle control system (see Section 11), then recheck the output linkage free play.

5. Retighten the locknut and recheck the free play.

Supplemental Restraint System (SRS)

Component Location Index	23-330
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Circuit Diagram	23-332
Wiring Location	23-333
Precautions/Procedures	23-334
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Airbag Assembly	
Removal	23-350
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Removal	23-354
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Supplemental Restraint System (SRS)

Component Location Index

NOTE: RHD type is symmetrical to LHD type.

SRS INDICATOR LIGHT
(in the gauge assembly)
Troubleshooting, page 23-338
Gauge assembly, page 23-144

SLIP RING
Removal, page 23-354
Installation, page 23-355

SRS UNIT SUB HARNESS

**UNDER-DASH
FUSE BOX**

SRS MAIN HARNESS

SRS UNIT

INFLATOR

AIRBAG

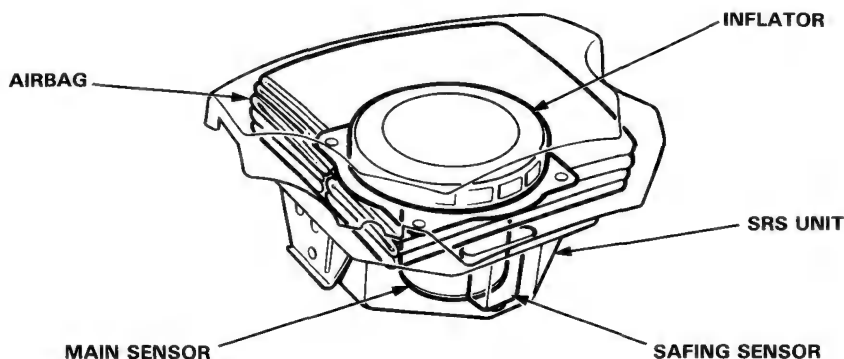
SRS AIRBAG ASSEMBLY
Removal, page 23-350
Installation, page 23-351
Disposal, page 23-352



Description

The SRS is a safety device which, as a supplement to the seat belt, is designed to protect the driver by operating when the car receives a frontal impact exceeding a certain set limit.

The system is comprised of the airbag assembly (which in turn consists of the SRS unit, inflator, and airbag) and the slip ring.



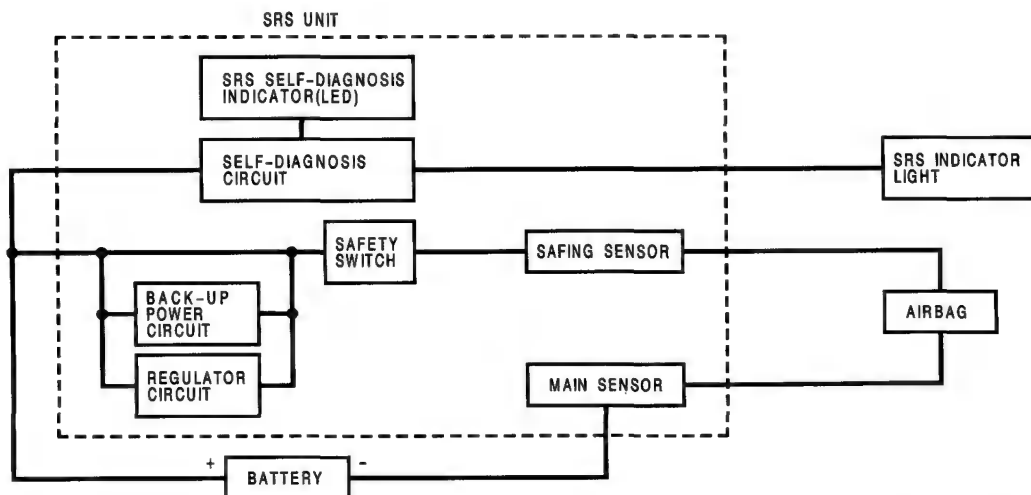
Operation

As shown in the diagram below, the main and safing sensors, and the safety switch are connected in series to the airbag inflator and the battery. A regulator circuit (increasing the reliability of the SRS system by raising the voltage when battery voltage drops) and a back-up power circuit are connected in parallel with the battery. The sensors, the safety switch, regulator and back-up circuits, and a self-diagnosis circuit (see description on next page) are all built into the SRS unit.

Sequence of operation:

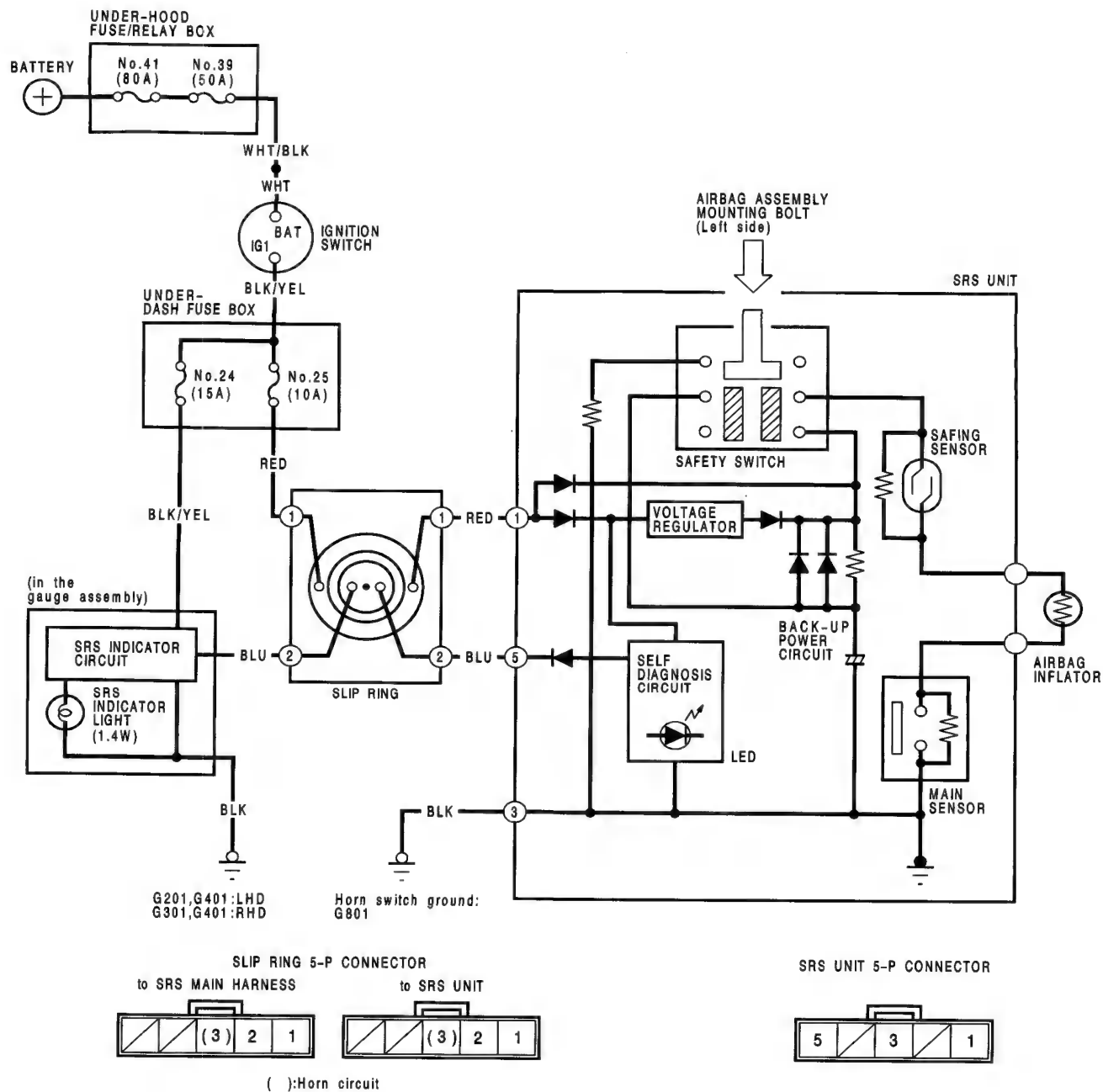
- (1) The main sensor and the safing-sensor activate.
- (2) Power is supplied to the airbag inflator by the battery or the back-up power circuit if the battery is disconnected due to the impact.
- (3) The airbag deploys.

The two sensors must be activated simultaneously for at least 0.025 seconds to deploy the airbag. After the impact, it takes about 0.05 seconds for the airbag to fully deploy.



Supplemental Restraint System (SRS)

Circuit Diagram

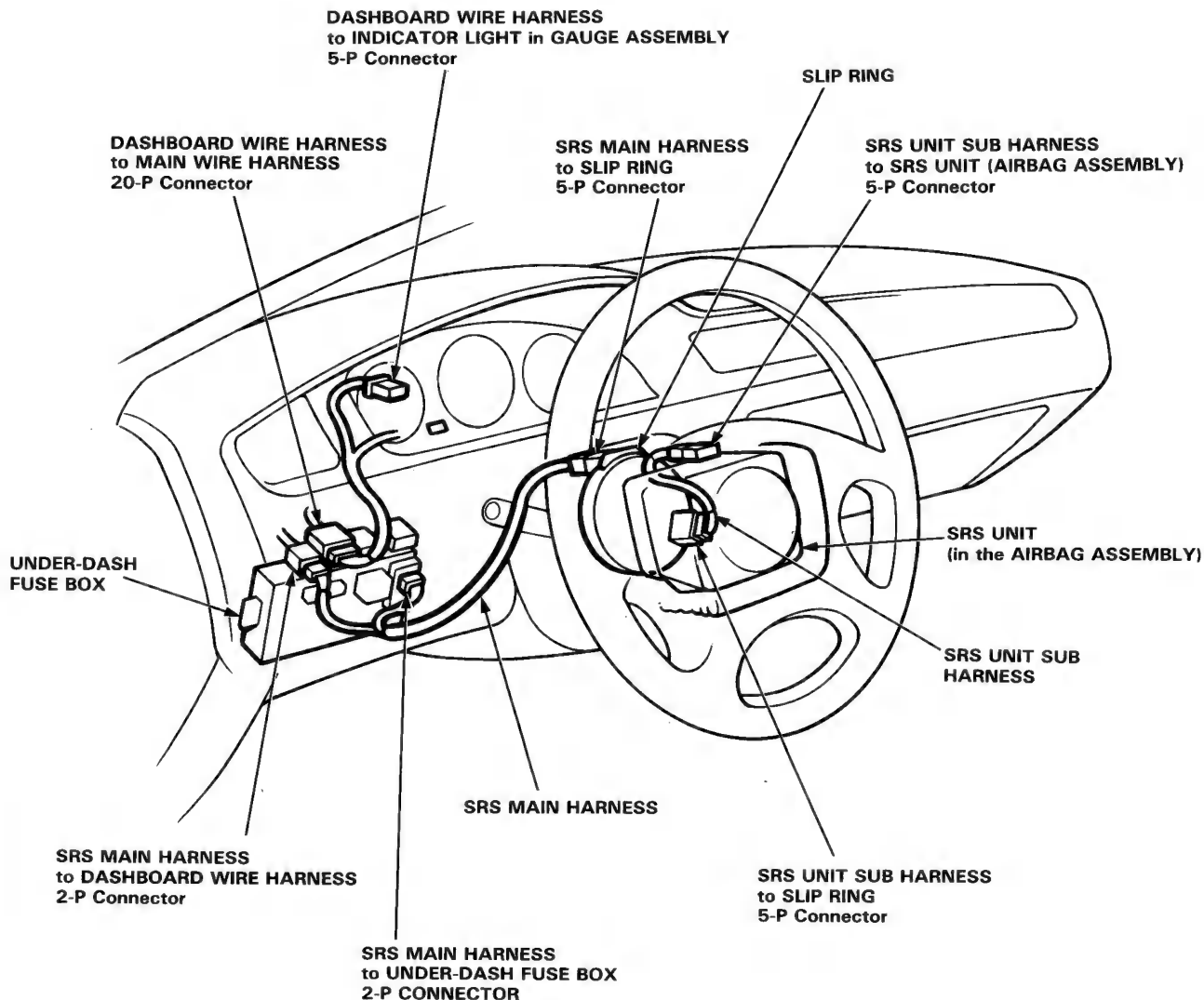


Wiring Locations

CAUTION: Make sure all SRS ground locations are clean and grounds are securely attached.

NOTE:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.
- RHD type is symmetrical to LHD type.

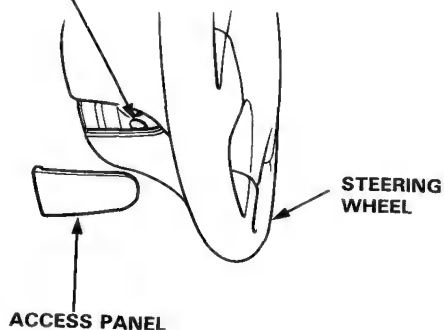


Supplemental Restraint System (SRS)

General Precautions

- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation:
 - Airbag assembly.
 - Slip ring.
 - Steering wheel.
- Use only a digital circuit tester to check the system. Using an analog circuit tester may cause an accidental deployment and possible injury.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Replacement of the combination light and wiper/washer switches and cruise control switch can be done without removing the steering wheel:
 - Combination light and wiper/washer switch replacement (see page 23-213).
 - Cruise control switch replacement (see page 23-326).
- After completed work, check that the connectors are installed tightly:
 - the SRS indicator light should go off 6 sec after the ignition switch has been turned on.
 - with the ignition switch turned on, the LED of the SRS unit should blink one time.

LED
(in the SRS unit)

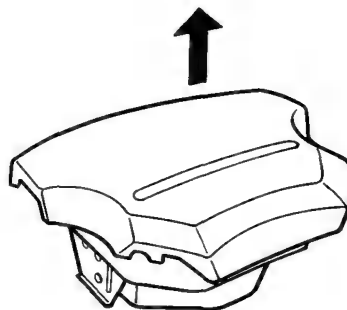


Airbag Handling and Storage

- Do not try to disassemble the airbag assembly. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.
- Be careful that the airbag assembly receives no strong shocks; it could deploy.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.

For temporary storage of the airbag assembly during service, observe the following precautions:

- Store the removed airbag assembly with the pad surface up.



⚠ WARNING If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury

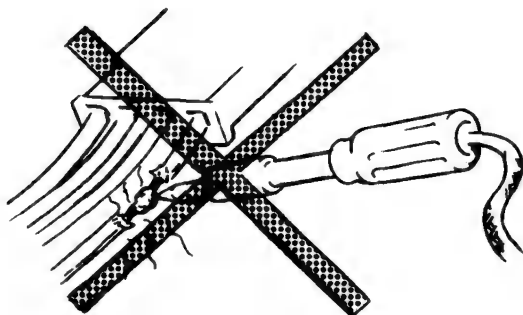
- Store the removed airbag assembly on a secure flat surface away from any high heat source (exceeding 85°C/185°F) and free of any oil, grease, detergent or water.

CAUTION: Improper handling or storage can internally damage the airbag assembly, making it inoperative. You suspect the airbag assembly has been damaged, install a new unit and refer to the Deployment/Disposal Procedures for scrapping of the damaged airbag.

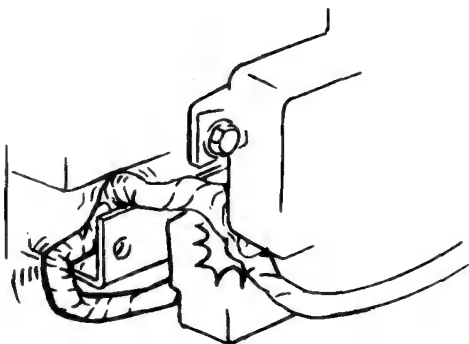
Wiring Precautions

- Never attempt to modify, splice or repair SRS wiring.

NOTE: SRS wiring can be identified by special yellow outer protective covering.



- Be sure to install the harness wires so that they are not pinched or interfering with other car parts.

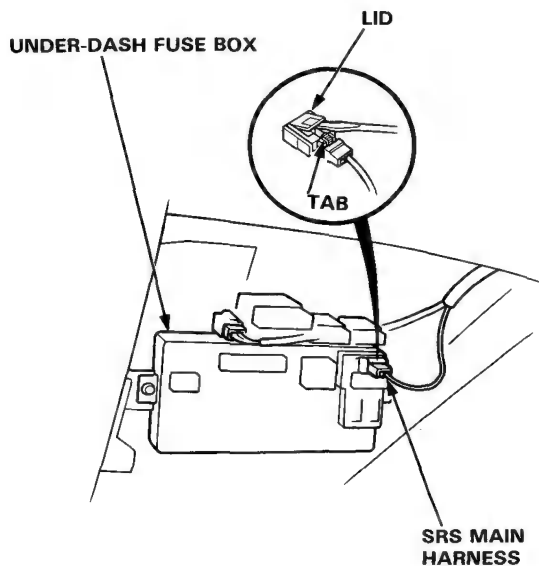


- Make sure all SRS ground locations are clean and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

- Disconnecting the SRS Connector at the Fuse Box:

CAUTION: Avoid breaking the connector; it's double-locked.

First lift the connector lid with a thin screwdriver, then press the connector tab down and pull the connector out.



To reinstall the connector, push it into position until it clicks, then close its lid.

(cont'd)

Supplemental Restraint System (SRS)

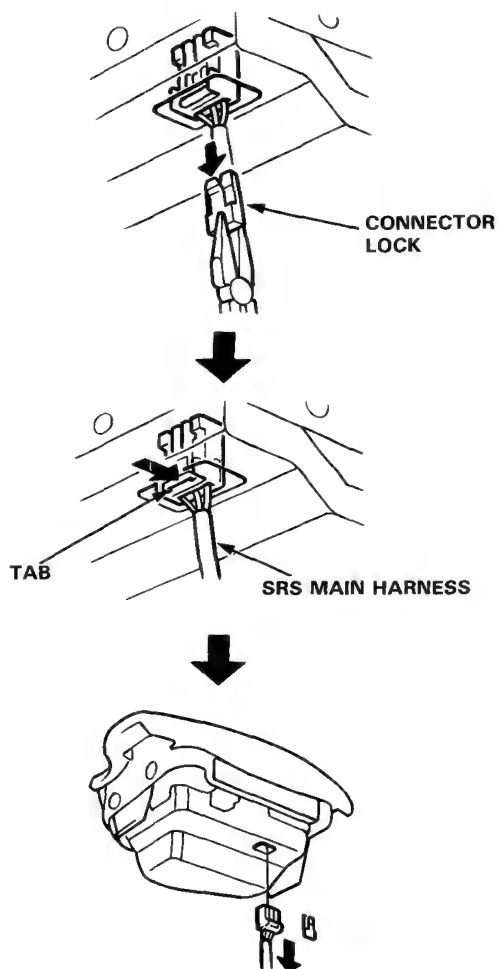
Wiring Precautions (cont'd)

- Disconnecting the SRS Connector at the SRS Unit and Slip ring:

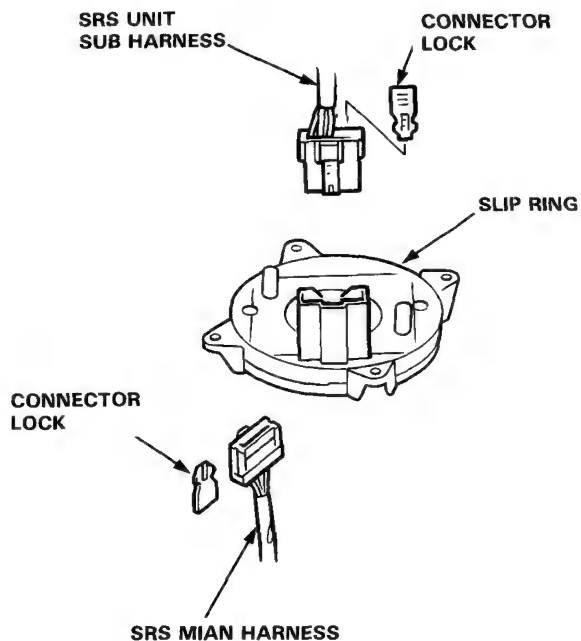
NOTE: Dispose of the connector lock; not reuse it.

1. Pull the connector lock piece out with pliers.
2. Depress the connector tab and pull the connector out.

SRS UNIT:



SLIP RING:

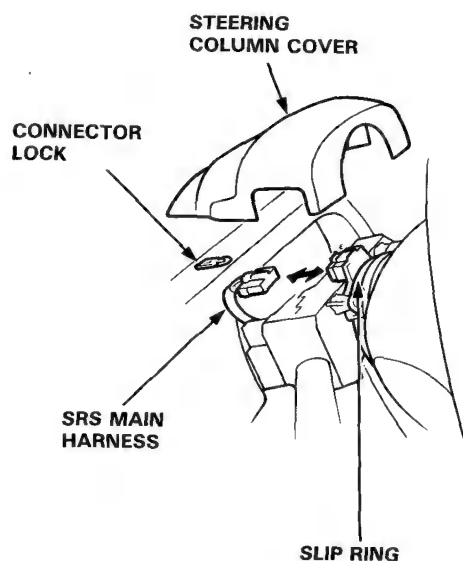


Steering-related Precautions

● Steering Column Removal:

CAUTION:

- Turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Be careful that the steering wheel receives no strong shocks.
- Before removing the steering column, first disconnect the connector between the slip ring and the SRS main harness.
- If the steering column is going to be removed without dismounting the steering wheel, lock the steering by turning the ignition key to 0-LOCK position or remove the key from the ignition so that the steering wheel will not turn.



● Steering Wheel:

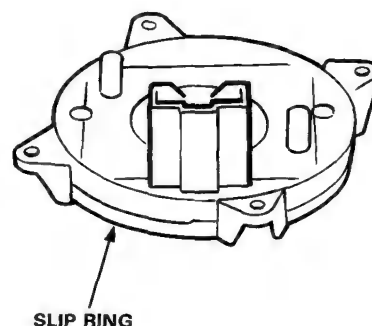
Do not replace the original steering wheel with any other design, since it will make it impossible to properly install the airbag (only use genuine HONDA replacement parts).

After reassembly confirm that the wheels are still straight ahead and that steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjustment of the tie-rods, not by removing and repositioning the steering wheel.

● Slip Ring

CAUTION:

- Do not grease the slip ring.
- Do not disassemble the slip ring. It has no serviceable parts and has to be replaced as a whole.
- The slip ring is a special part of models equipped with SRS. When replacing, be sure to use only a genuine HONDA spare part.



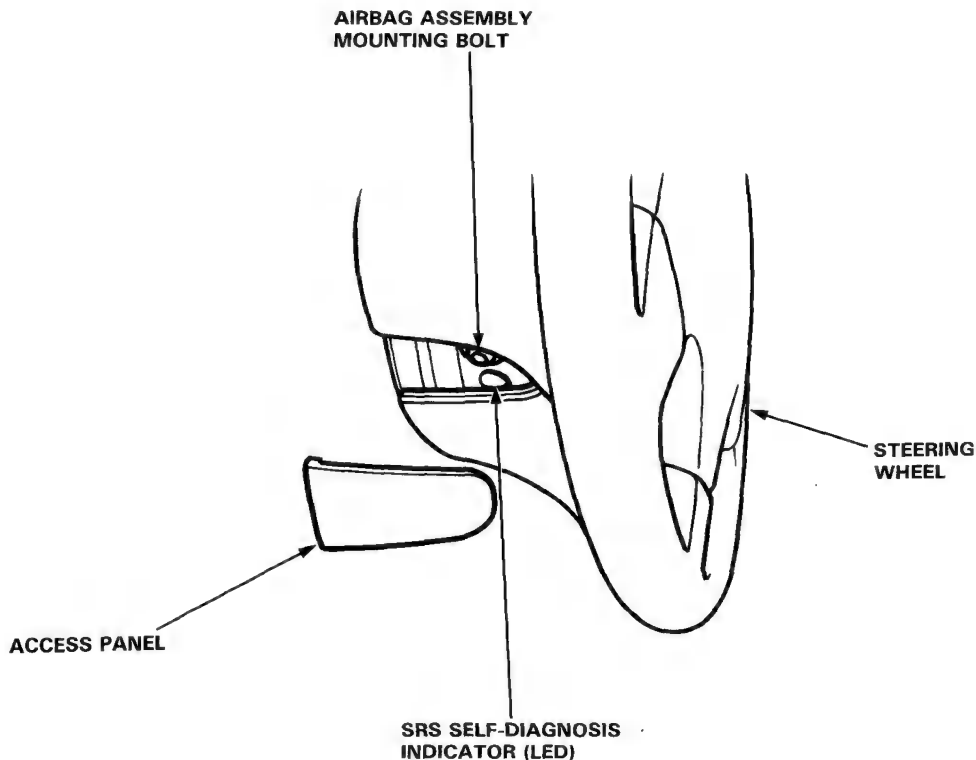
Supplemental Restraint System (SRS)

Troubleshooting

Self-diagnosis system

When the ignition switch is turned ON, the SRS indicator light comes on and goes off after about 6 seconds, and the self-diagnosis indicator (LED) blinks one time, if the system is operating normally. If there is an abnormality in the SRS, the SRS indicator light will stay on while the LED in the SRS unit will indicate the system problem by blinking a failure code (see the table on next page).

- If the SRS indicator light does not come on, or does not go off after 6 seconds, or if it comes on while driving, the system must be inspected and repaired as soon as possible.
- To see the indicated failure code, remove the access panel at the left side of the steering wheel.
- If there is a failure in the system, the LED will first blink one time (OK signal), then it will indicate the failure code.
- If simultaneous system problems occur, the LED will indicate only the problem with the higher priority. The problem with the highest priority is that on top of the failure code table, the problem with the lowest priority is that at the bottom of the table (see page 23-339).





Failure Code Table

Self-diagnosis indicator (LED) blinks	SRS indicator light	Cause
1	doesn't come on (with the ignition switch turn ON)	<ul style="list-style-type: none">● Blown No. 25 (10 A) fuse.● Blown SRS indicator light bulb.● Poor ground.
0	doesn't go off	<ul style="list-style-type: none">● Faulty SRS unit.● Poor ground.
1		<ul style="list-style-type: none">● Short (or open) in SRS indicator wire harness.
stay on continuously		<ul style="list-style-type: none">● Faulty SRS self-diagnosis circuit.
2		<ul style="list-style-type: none">● Faulty safety switch.
3		<ul style="list-style-type: none">● Faulty back-up power circuit.
4		<ul style="list-style-type: none">● Faulty safety switch.
5		<ul style="list-style-type: none">● Open in airbag inflator.
6		<ul style="list-style-type: none">● Open in main sensor.● Short in safing sensor.
7		<ul style="list-style-type: none">● Short in main sensor.● Open in safing sensor.

(cont'd)

Supplemental Restraint System (SRS)

Troubleshooting (cont'd)

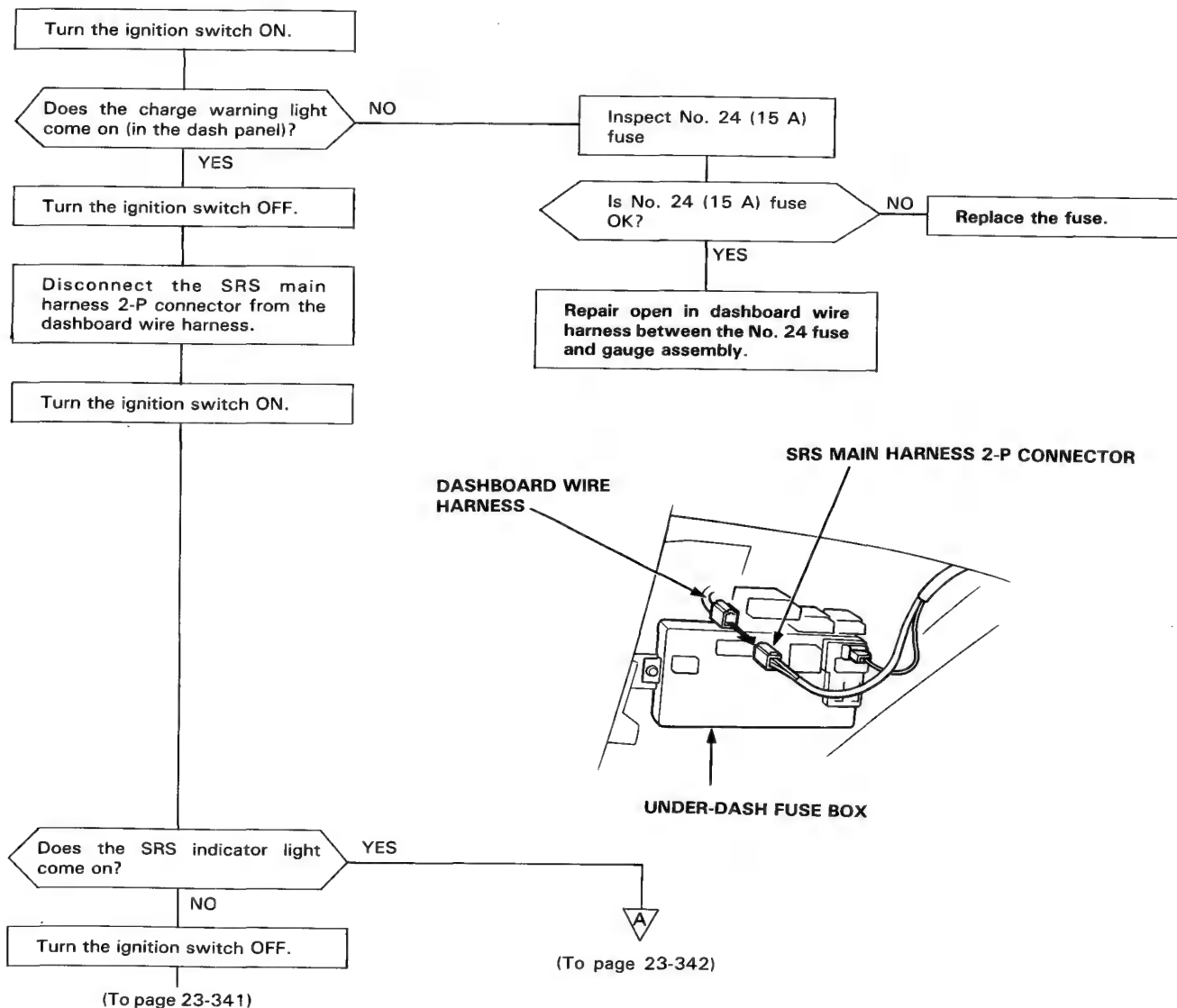
THE SRS INDICATOR DOES NOT LIGHT

NOTE:

- The SRS indicator light will not come on until 6 seconds after the ignition switch has been turned on.
- The LED of the SRS unit should blink one time.

CAUTION:

- Use only a digital circuit tester to check the system.



(From page 23-340)

Reconnect the SRS main harness 2-P connector to the dashboard wire harness.

Disconnect the negative and positive battery cables, and wait three minutes.

Remove the airbag assembly from the steering wheel (see page 23-350).

Disconnect the SRS unit sub harness 5-P connector from the SRS unit (airbag assembly).

Reconnect the positive and negative battery cables, then turn the ignition switch ON.

Does the SRS indicator light come on?

NO

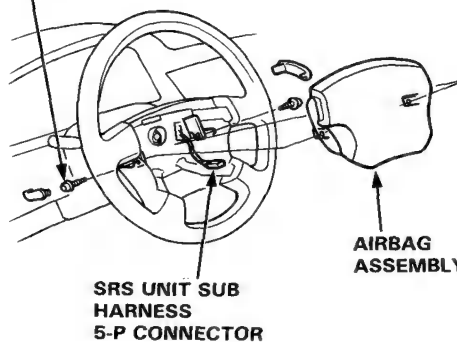
Short in the BLU wire of SRS unit sub harness, SRS main harness or the slip ring. Replace faulty component.

YES

SRS unit is faulty. Replace the airbag assembly.

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX® bolt first (the safety switch will automatically turn off).

TORX® BOLT
(LEFT SIDE)

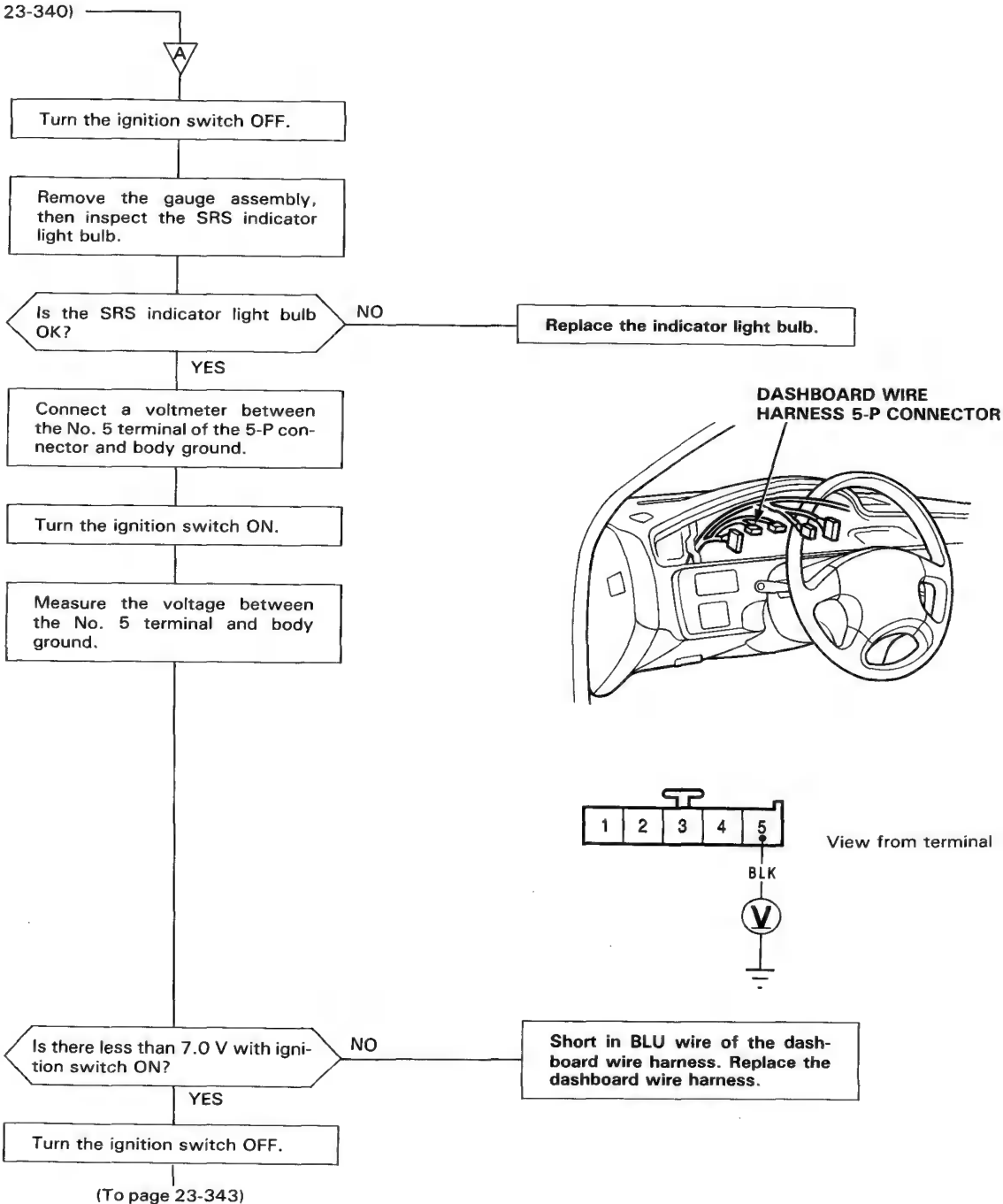


(cont'd)

Supplemental Restraint System (SRS)

Troubleshooting (cont'd)

(From page 23-340)



(From page 23-342)

Connect the voltmeter between the No. 1 terminal (+) and the No. 3 terminal (-) of the dashboard wire harness 5-P connector.

Turn the ignition switch ON.

Measure the voltage between the No. 1 terminal and the No. 3 terminal.

Is there battery voltage?

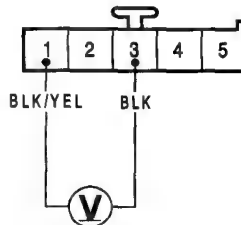
YES

The SRS indicator circuit in the gauge assembly is faulty.

NO

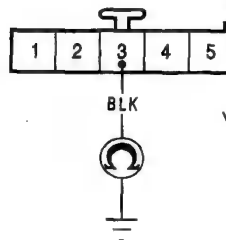
Check for continuity between the No. 3 terminal and body ground.

**DASHBOARD WIRE HARNESS
5-P CONNECTOR**



View from terminal side

**DASHBOARD WIRE HARNESS
5-P CONNECTOR**



View from terminal side

Does continuity exist?

YES

Repair open in the BLK/YEL wire (No. 1 terminal) of the dashboard wire harness between the gauge assembly and the No. 24 fuse.

NO

Repair open in the BLK wire (No. 3 terminal) between the gauge assembly and body ground or look for a poor ground (G201, 401).

(cont'd)

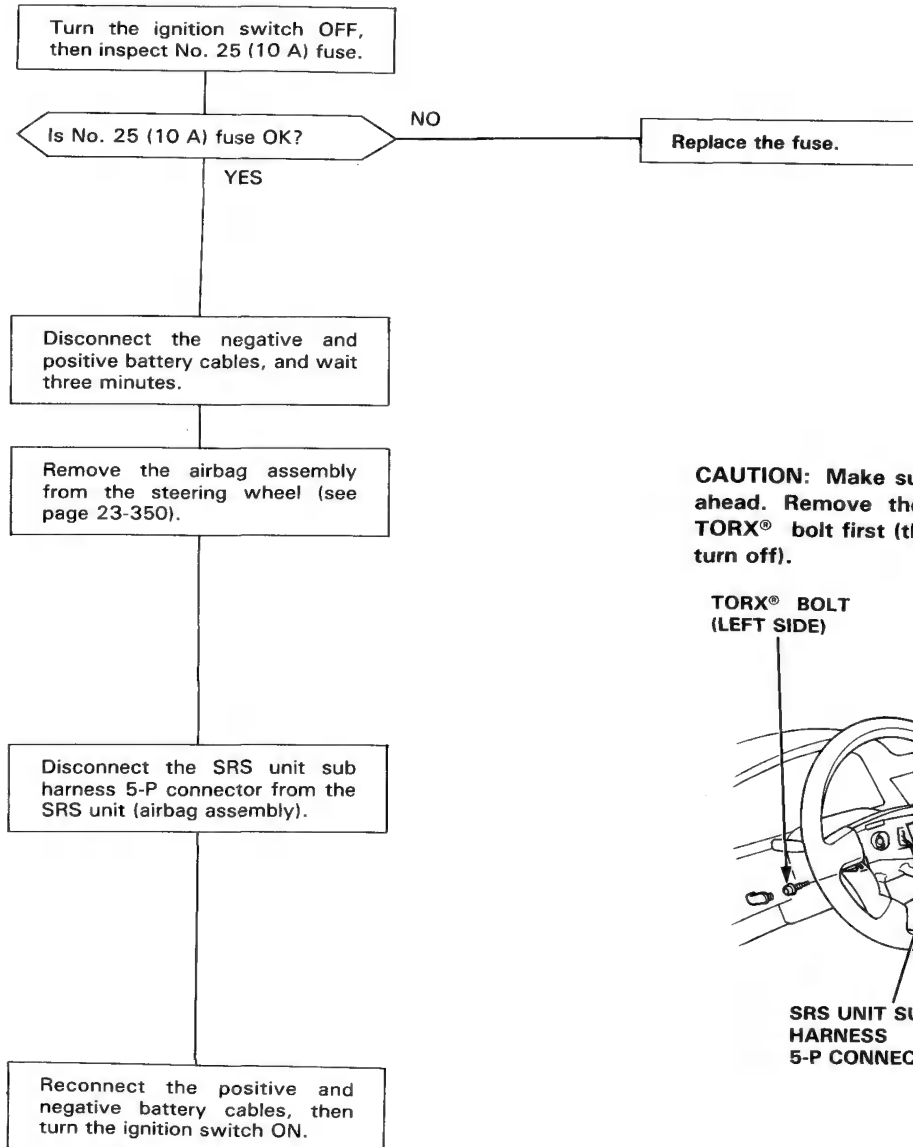
Supplemental Restraint System (SRS)

Troubleshooting (cont'd)

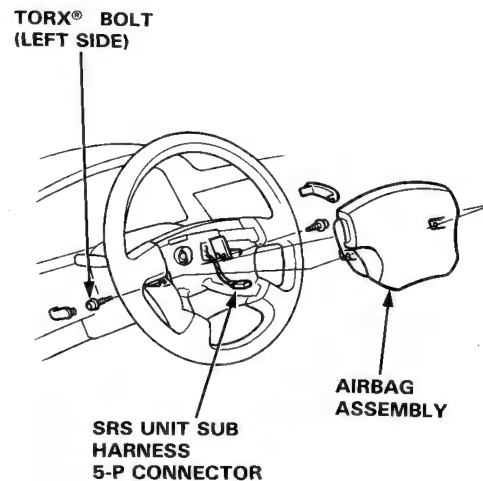
THE SRS INDICATOR LIGHT STAYS ON CONTINUOUSLY

NOTE:

- The LED of the SRS unit does not light.



CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX® bolt first (the safety switch will automatically turn off).



(To page 23-345)

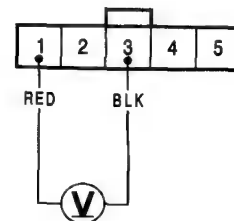
(From page 23-344)

NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.

Measure the voltage between the No. 1 terminal and the No. 3 terminal of the SRS unit sub harness 5-P connector.



**SRS UNIT SUB HARNESS
5-P CONNECTOR**



View from terminal side

Is there battery voltage?

YES

**SRS unit is faulty.
Replace the airbag assembly.**

NO

Check for continuity between the No. 3 terminal and body ground.

Does continuity exist?

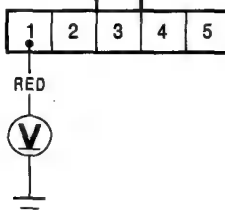
NO

Short to ground.

YES

Disconnect the SRS main harness 5-P connector from the slip ring.

View from terminal side



Measure the voltage between the No. 1 terminal of the SRS main harness 5-P connector and body ground.

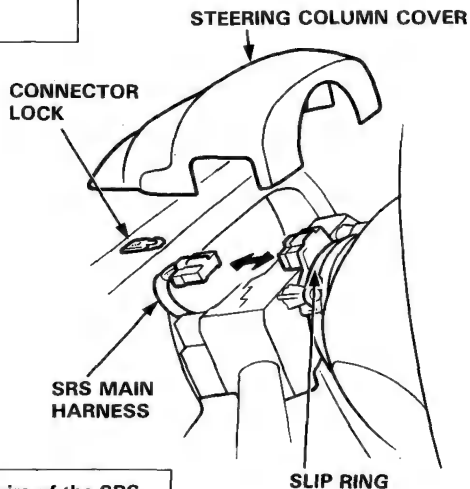
Is there battery voltage?

NO

Open in the RED wire of the SRS main harness between the fuse box and the slip ring. Replace the harness.

YES

Open in the RED wire of the SRS unit sub harness or the slip ring. Replace the faulty component.



(cont'd)

Supplemental Restraint System (SRS)

Troubleshooting (cont'd)

THE SRS INDICATOR LIGHT STAYS ON CONTINUOUSLY

NOTE:

- The LED of the SRS unit blinks one time.

Turn the ignition switch OFF, then disconnect the SRS main harness 2-P connector from the dashboard wire harness.

Measure the voltage between the No. 1 terminal of the SRS main harness 2-P connector and body ground.

Is there more than 7.0 V until 6 seconds after the ignition switch has been turned on.

YES

NO

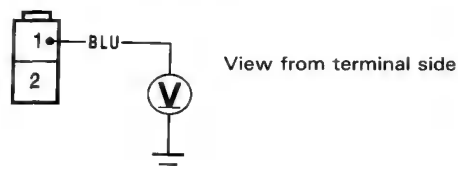
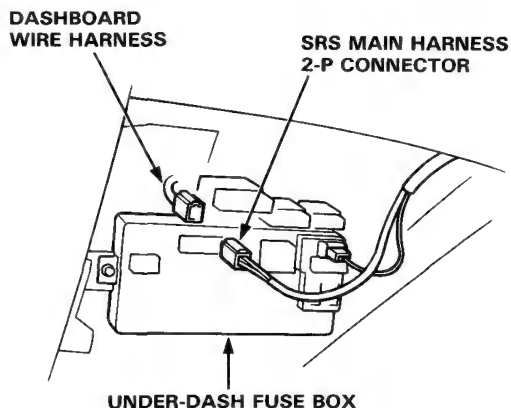
Turn the ignition switch OFF.

Disconnect the negative and positive battery cables, and wait three minutes.

Remove the airbag assembly from the steering wheel (see page 23-350).

Disconnect the SRS unit sub harness 5-P connector from the SRS unit (airbag assembly).

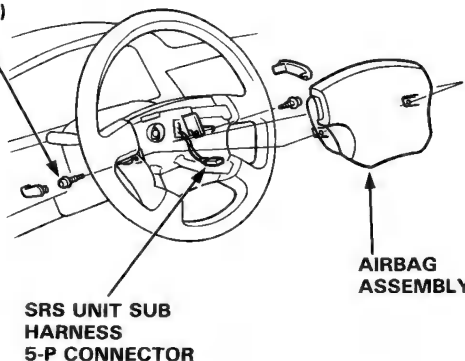
(To page 23-347)



(To page 23-348)

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX® bolt first (the safety switch will automatically turn off).

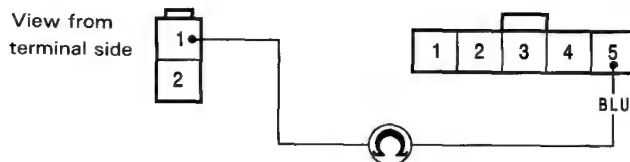
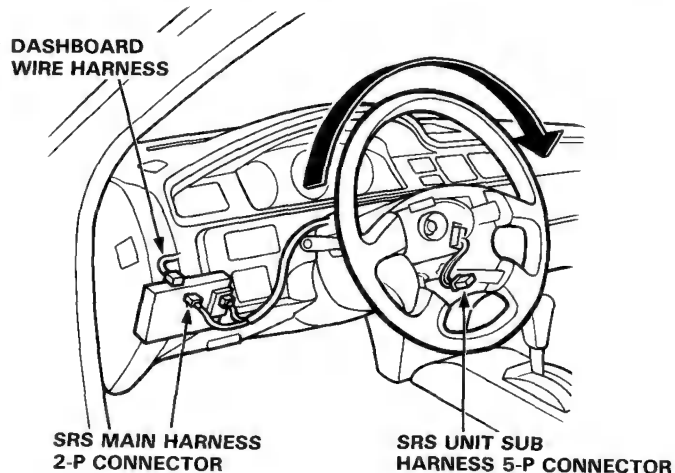
TORX® BOLT
(LEFT SIDE)



(From page 23-346)

Check for continuity between the No. 1 terminal of the SRS main harness 2-P connector and No. 5 terminal of the SRS unit sub harness 5-P connector.

NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.



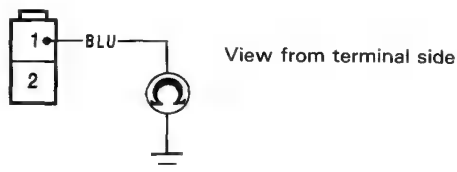
Does continuity exist?

NO

Open in the BLU wire of the SRS main harness, SRS unit sub harness or the slip ring. Replace the faulty component.

Check for continuity between the No. 1 terminal of the SRS main harness 2-P connector and body ground.

NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.



Does continuity exist?

YES

Short in the BLU wire of the SRS main harness, SRS unit sub harness or the slip ring. Replace the faulty component.

NO

SRS unit is faulty. Replace the airbag assembly.

(cont'd)

Supplemental Restraint System (SRS)

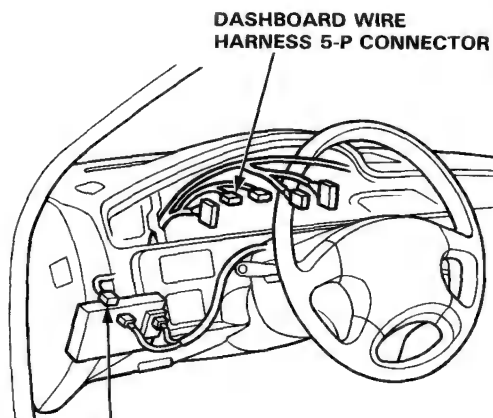
Troubleshooting (cont'd)

(From page 23-346)

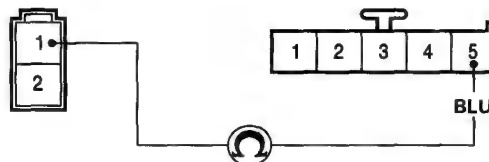


Turn the ignition switch OFF, then remove the gauge assembly.

Check for continuity between the No. 1 terminal and the No. 5 terminal of the dashboard wire harness.



DASHBOARD WIRE HARNESS 2-P CONNECTOR



View from terminal side

Does continuity exist?

NO

Open in the BLU wire of the dashboard wire harness. Replace the dashboard wire harness.

YES

The SRS indicator circuit in the gauge assembly is faulty. Replace it.



THE SRS INDICATOR LIGHT STAYS ON CONTINUOUSLY

NOTE:

- The LED of the SRS unit doesn't go off or blinks 2, 3, 4, 5, 6 or 7 times.

Replace the SRS airbag assembly.

Supplemental Restraint System (SRS)

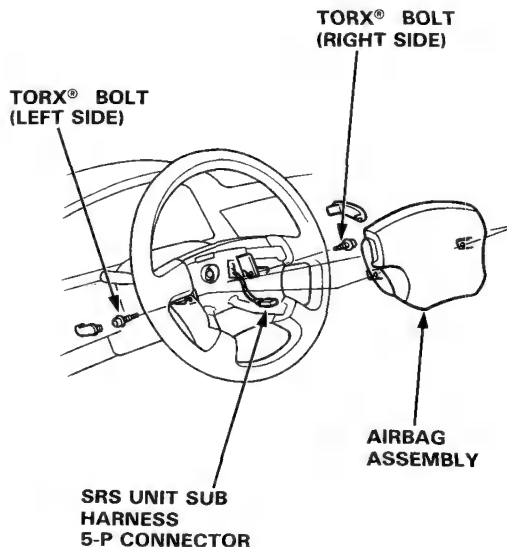
Airbag Assembly Removal

▲ WARNING Store a removed airbag assembly with the pad surface up, if the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION:

- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
 - Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
 - Carefully inspect the airbag assembly before installing it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
 - Do not disassemble or tamper with the airbag assembly.
 - Special bolts are necessary for installing the airbag assembly. Do not use other bolts.
 - Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX bolt first (the safety switch will automatically turn off).
1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.

2. Remove the TORX bolts using a TORX T30 bit, then remove the airbag assembly.
3. Disconnect the SRS unit sub harness 5-P connector from the SRS unit, then remove the airbag assembly from the steering wheel.



Airbag Assembly Installation

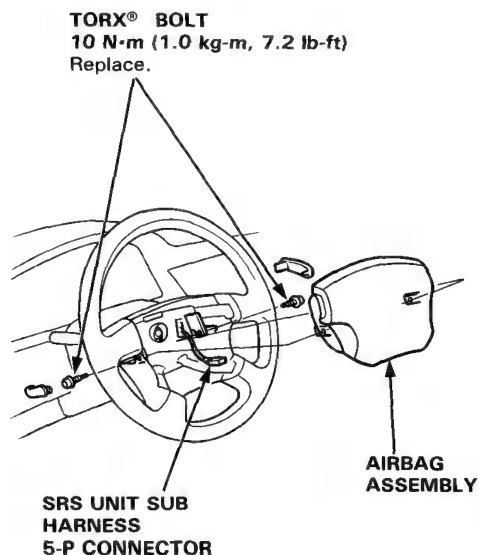
CAUTION:

- Be sure to install the SRS wiring so that it is not pinched or interfering with other car parts.
- Be sure the battery cables are disconnected.

1. Reconnect the SRS unit sub harness 5-P connector to the SRS unit.
2. Place the airbag assembly in the steering wheel, and secure it with new TORX bolts.

NOTE: Be sure to torque the bolts as specified.

3. Reconnect the battery positive and negative cables.
4. After installing the airbag assembly, confirm proper system operation:
 - Turn the ignition to ON: the instrument panel SRS indicator light should go on for about 6 seconds and then go off.
 - The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.



Supplemental Restraint System (SRS)

Airbag Disposal

Before scrapping any airbag (including one in a whole car to be scrapped) the airbag must be deployed. If the car is still within the warranty period, before deploying the airbag, the HONDA District Service Manager must give approval and/or special instruction.

Only after an airbag is already deployed (as the result of vehicle collision, for example), can the normal scrapping procedure be done.

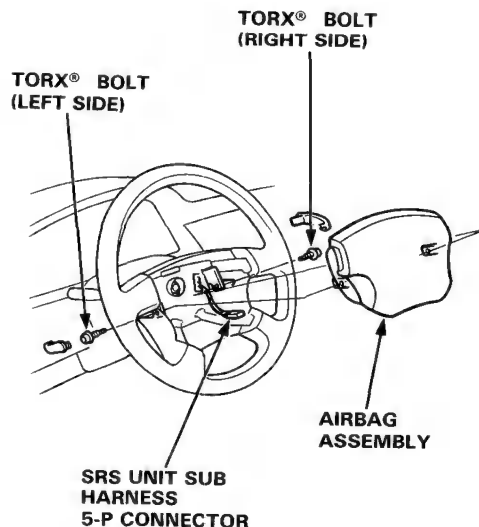
If the airbag appears, intact (not deployed), it should be treated with extreme caution.

Follow the procedure, described below.

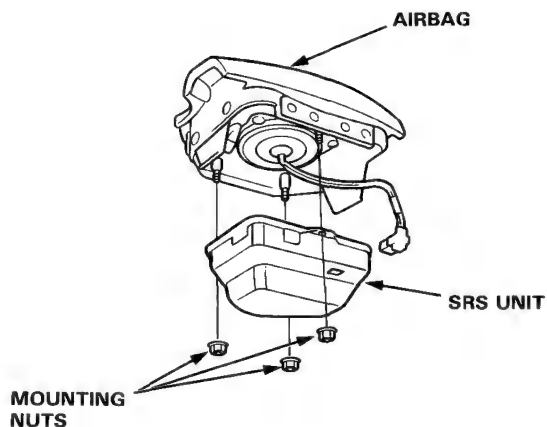
1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
2. Remove the TORX bolts using a TORX T30 bit, then remove the airbag assembly (see page 23-350).

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX bolt first (the safety switch will automatically turn off).

3. Disconnect the SRS unit sub harness 5-P connector from the SRS unit, then remove the airbag assembly from the steering wheel.



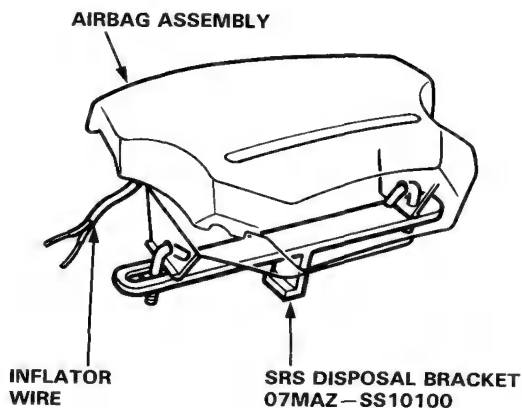
4. Remove the 3 SRS unit mounting nuts from the airbag assembly, then remove the SRS unit.



5. Install the SRS Disposal Bracket on the airbag assembly, and clamp it firmly into a vice.

⚠ WARNING Confirm that the airbag assembly is securely clamped or mounted; otherwise, severe personal injury could be caused by the deployment.

NOTE: Instead of using the SRS Disposal Bracket, the airbag assembly may be reinstalled to the steering wheel.

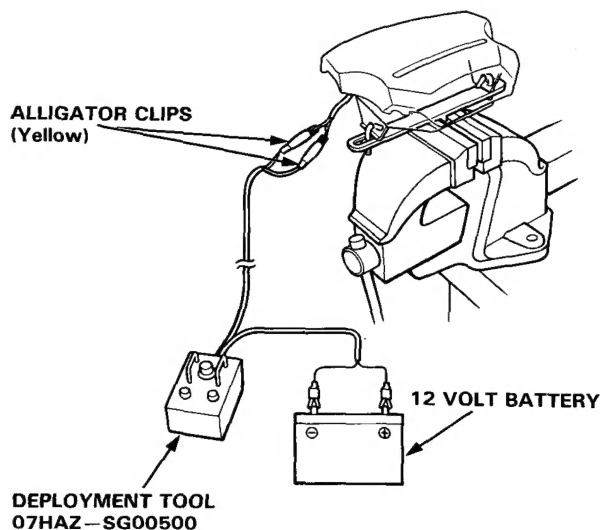


6. Cut off the airbag connector, then strip the wire ends.

7. Confirm that the Deployment Tool is functioning properly (see check procedure on page 23-353).

8. Connect the alligator clips to the inflator wire ends.

⚠ WARNING The distance between deployment tool and airbag assembly has to be at least 10 meters (30 ft).



9. Connect a 12 volt battery to the tool:

- If the green light on the tool goes on, the airbag igniter circuit is defective and cannot deploy the bag. Go to Damaged Airbag Special Procedure.
- If the red light on the tool goes on, the airbag is ready to be deployed.

10. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible—a loud noise and rapid inflation of the bag, followed by slow deflation).

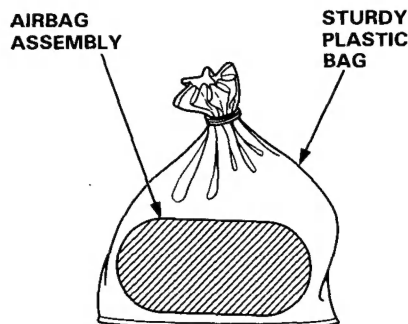
- If audible / visible deployment happens and the green light on the tool goes on, continue with this procedure.
- If the airbag doesn't deploy, yet the green light goes on, it's igniter is defective. Go to Damaged Airbag Special Procedure.

⚠ WARNING During deployment, the airbag assembly can become hot enough to burn you. Wait thirty minutes after deployment before touching the assembly.

11. Dispose of the complete airbag assembly. No part of it can be reused. Place it in a sturdy plastic bag and seal it securely.

CAUTION:

- Wear a face shield and gloves when handling a deployed airbag.
- Wash your hands and rinse them well with water after handling a deployed airbag.



Damaged Airbag Special Procedure.

⚠ WARNING If an airbag cannot be deployed, it should not be treated as normal scrap; it should still be considered a potentially explosive device that can cause serious injury.

1. If installed in a car, follow the removal procedure on page 23-352.
2. Package the airbag in exactly the same packaging that the new replacement part came in.
3. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
4. Contact your HONDA District Service Manager for how and where to return it for disposal.

Deployment Tool: Check Procedure.

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means tool is OK; red means tool is faulty.
3. Disconnect the battery and the yellow clips.

Supplemental Restraint System (SRS)

Slip Ring Removal

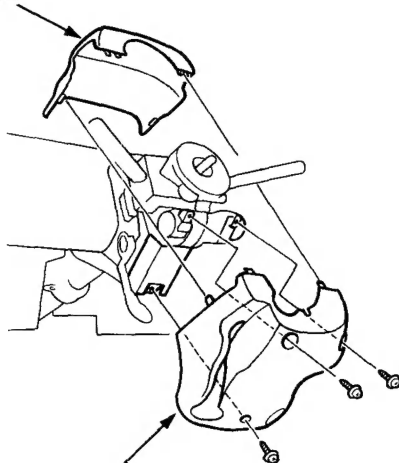
⚠ WARNING Store a removed airbag assembly with the pad surface up, if the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION:

- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Do not disassemble the slip ring. It has no serviceable parts and has to be replaced as a whole.
- The slip ring is a special part of models equipped with SRS. When replacing, be sure to use only a genuine HONDA spare part.
- Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting TORX bolt first (the safety switch will automatically turn off).

1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
2. Remove the airbag assembly (see page 23-350).
3. Remove the steering wheel, then remove the upper and lower steering column covers.

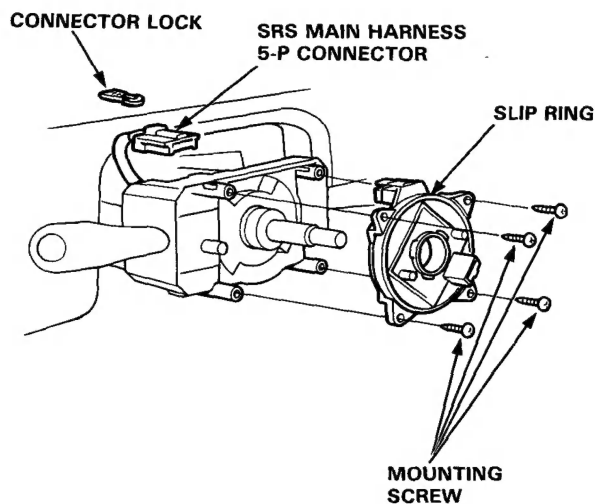
UPPER COLUMN COVER



LOWER COLUMN COVER

4. Pull out the connector lock, then disconnect the SRS main harness 5-P connector from the slip ring.

NOTE: Dispose of the connector lock, it is not to be reused.

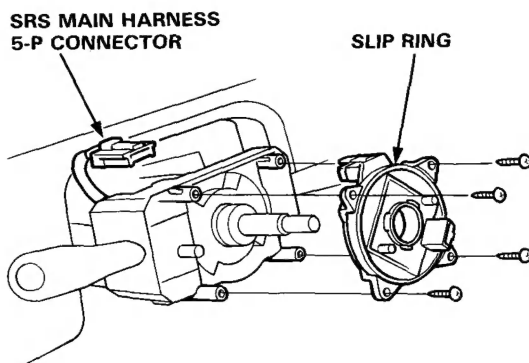


5. Remove the 4 mounting screws, then remove the slip ring.

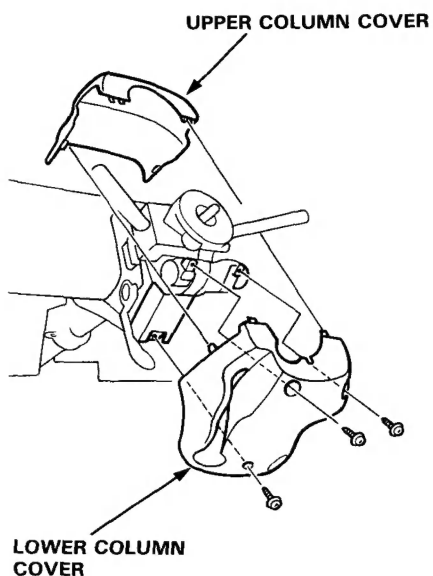
Slip Ring Installation

CAUTION: After reassembly, confirm that the wheels are still straight ahead and that the steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary do so only by adjustment of the tie-rods, not by removing and repositioning the steering wheel.

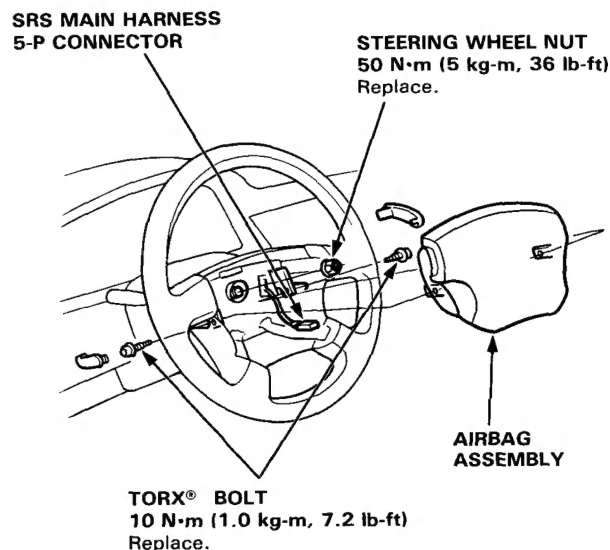
1. Install the slip ring on the steering column, then connect the SRS main harness 5-P connector to the slip ring.



2. Install the steering column upper and lower covers.



3. Install the steering wheel.



4. Connect the SRS unit sub harness 5-P connector to the SRS unit.

5. Place the airbag assembly into the steering wheel, and secure it with new TORX bolts.

NOTE: Be sure to torque the bolts as specified.

6. Reconnect the battery positive and negative cables.

7. After installing the slip ring, confirm proper system operation:

- Turn the ignition to ON: the instrument panel SRS indicator light should go on for about 6 seconds and then go off.
- The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.

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